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Vol 2 No 3 July 1986

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All the news that's fit to print for owners of both 8 bit and ST machines

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£25 for you!

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Two special offers for *Atari User* subscribers this month. You can save 50 per cent on insuring your Atari system (including all peripherals). And you can save up to £10 on blank discs

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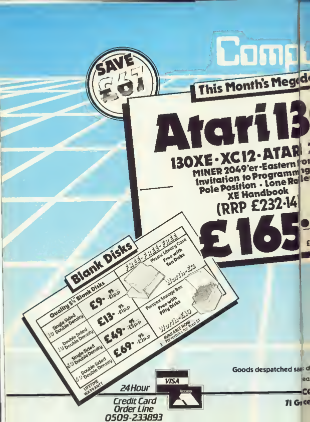

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New insurance scheme for your Atari

A UNIQUE personal computer insurance package which for the first time offers breakdown cover is now available to subscribers to *Atari User*

Underwritten by the giant Cornhill Insurance group the scheme also provides protection against theft accidental loss and damage at savings of up to 50 per cent making it the cheapest in the country

While the theft clause only applies to micros that are stolen from lockable buildings the accidental loss and damage cover s for anywhere in the UK – even while the computer is in transit

Negotiated by Database Publications on behalf of its readers with leading brokers Mason and Mason of Wilmslow the breakdown section covers call out labour and materials charges for all micros not under warranty

As with all current policies different rates apply to urban and metropolitan areas the latter being judged high risk areas for theft

Typical examples of annual premiums reveal that cover for a system – micro and peripherals – valued at £200 would be £10 at £500 some £16 and at £1 000 approximately £35

Businessmen who subscribe to *Atari User* will also have the opportunity to join a company scheme which provides additional cover

"The market has been crying out for a policy of this kind – particularly involving breakdown – for years says Derek Meakin head of Database We are just pleased that we are able to offer it first to subscribers to *Atari User*

For further details see Page 56

ST is outselling the Macintosh

A TOP secret report has revealed that Atari ST computers are currently outselling the popular Apple Macintosh machines in the UK

Commissioned by Atari UK and only just completed the document provides conclusive evidence that the ST is showing its rival a clean pair of heels So much so that in certain parts of the country the ratio is as high as three to one in favour of the ST

It is true that we have now learned that the Atari is outselling the Macintosh says Max Bambridge Atari UK s boss and our sales are almost equally divided between the 520ST and the 1040ST

While refusing to disclose actual figures – you ll get those at the end of the ST's first full year in operation – Atari s man in Britain is known to be well pleased with the results to date

'This latest news only indicates that we are well on target he told *Atari User*

Meanwhile Atari s claim to have overtaken the Macintosh received support from a somewhat unusual quarter – the former Macintosh marketing manager

Nigel Parry left Apple in August 1984 and set up Laser Software primarily to cater for the Macintosh market Since the arrival of the ST however his company has been producing products for both machines

Now he reports that the ST is accounting for a lot more sales than the Apple computer It works out to be in the region of 2 5 to one he says Atari s policy of providing a simple user interface at a fraction of the cost of competitive systems has meant a large and increasing installed base

The product most in demand by ST users from Laser is its Laserbase ST which retails for £99 95 – and Nigel Parry reports that much of the interest is coming from schools As a result the software house has announced educational discounts for its programs

Not that this boom in sales from the ST market means that Nigel Parry intends to turn his back on the Macintosh

I m not knocking the Macintosh in any way he says and anyone who drops in at my office will find I use both a Macintosh and an ST

But it seems as far as users are concerned Atari has delivered the right machine at the right price and is successfully exploiting the last niche left in the market

Kim's 800XL wins the MicroLink competition

Vo[illegible] Ruddon 65 [illegible] Centre manager and his assistant welcome Mrs Jane Burgess the winner s wife in London

COMPUTER shop salesman Kim Burgess used his Atari 800XL to win a free weekend in London

Kim 33 correctly answered 15 questions about MicroLink the UK s fastest growing electronic mail service

The competition was organised in conjunction with British Rail who offer seat and sleeper reservations using MicroLink s new telebooking service Hundreds of entrants successfully answered the 15 questions but Kim s was the first name drawn from a hat.

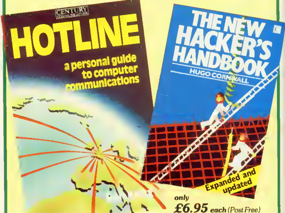
Much to the delight of his wife Jane he won a weekend in London for two free rail travel luxury accommodation at a London hotel free tickets to a Database Exhibitions computer show and finally a wonderful trip to Stratford upon Avon on a steam-hauled excursion train

Kim of Bromley Kent said I used my Atari 800XL to log on to MicroLink and then searched through the text to find the answers

I find MicroLink very useful In fact we have just booked two seats for a London theatre using the system

It was an incredible weekend My wife and I thoroughly enjoyed the outing Everything was perfect

Two books that tell you all you want to know about communications . . .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THE NEW HACKER'S HANDBOOK is a complete revision of one of the most talked about books ever written about the controversial subject of hacking – including pointers on how to go where you're not really supposed to go! Subjects include sophisticated hacking techniques new methods of computer security a guide to trouble shooting pages of telephone numbers you can experiment with – and stories of classic hacking hoaxes

PLEASE USE THE ORDER FORM ON PAGE 57

John knows how to keep his customers happy

SCOTSMAN John Mullen has turned his computer shop into a real At-Home-with-Atari club. People who pop in with queries or wanting details about Atari machines and software end up sipping coffee served by one of his nine strong staff.

And those who are really hooked on computers are even invited to join him on coach outings to see what's new in the computer world at exhibitions.

John, managing director of Warrington (Cheshire) All Computers, cannot stop thinking up novel ideas to keep his customers happy.

"When I had an Atari 800 XL a few years ago I just could not get any help with it. I realised there was a vast gap in the market so I set up my own shop. Now I have two branches and the Atari models have lots of enthusiasts", he said.

"To survive you have to be aware of the computer market, read magazines like the *Atari User* and visit trade and public shows to see how the public react.

"I found it expensive for a family to go down to London for an exhibition so I arranged to hire a coach to visit every show and have had no difficulty filling every seat with each customer just paying a share of the hire price – which works out about £12 from here".

As well as a full repair service John runs a customer request service. "Instead of them hunting about for new software – which generally is announced as being out but isn't – I do it for them and ring them when it is available", he said.

With the help of his manager Robert Blinkhorn he has now introduced an Atari Computer Club held in the evenings in an adapted stockroom.

For £3 a year families are encouraged to learn new skills and discuss problems or ideas at the club sessions.

John and his wife Kathryn, who does the accounts, believe keeping the customers happy and well served is a vital part of any business.

John Mullen – software and coffee

MERCENARY FOR THE ST

AN Atari ST version of the successful Mercenary – Escape from Targ game is due for release soon from Novagen.

Out now is The Second City, a second data set for the Mercenary game, which uses the load game facility to provide a new scenario.

Mercenary, The Second City and a Targ Survival Kit, which includes maps and books, costs £24.95.

New releases

NEW business graphics software for the Atari 8 bit range has been released by Artolasoft.

B/Graph is a presentation tool for sales, marketing, forecasting, accounting and management.

It can graph up to three factors with 100 data points each and convert instantly between graph types without re-entering data.

Statistical Analysis functions include standard deviation, variance, Chi-square, regression analysis and function plotting.

The twin disc costs £29.95.

* * *

AN Atari ST database that takes advantage of the Gem environment and works with a mouse has been released by Robtek.

Atari DB-Calc is designed for customised reports, mailing labels, memberships, sales, stocklists, office and personal records and financial statistics.

The database has an unlimited number of fields per record, superfast sort and even faster search on a field, says Robtek.

It selects on any combination of fields, allows all printer control functions and has a built-in text editor that integrates with mailmerge.

A calculator is built-in. Price £49.95.

* * *

A DATABASE management system from Haba Systems which is claimed to be intuitive has been released for the Atari 520ST and 1040ST.

Haba is planning to introduce a new title for the ST every month. Next release will be Haba Spelling Checker, designed to work with the company's word processor Habawriter.

Habaview costs £74.95.

* * *

A LEADING budget games company has brought out a new label for its software aimed at the Atari 8 bit range.

Mastertronic hopes this will increase its market share – currently 11 per cent – by as much as four per cent.

Announcing the new label – Entertainment USA – with two new games for the Atari 8 bit machines, Bump Set Spike Double Volley Ball and Vegas Poker, a spokesman said: "Certainly over the next year we expect our market share to be in excess of 15 per cent and the Atari machines could be a significant factor in that increase".

The games each cost £1.99.

* * *

LATEST Adventure released by Level 9 for the Atari 8 bit range is Price of Magik.

Object is to take over the red moon crystal ball and learn spells to control the enemy.

The game has two programs on a single cassette and costs £9.95.

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Page 6
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New ribbons for old

A NEW-ribbon for-old scheme for Atari printers has been set up by Aladdink Used printer ribbon cassettes sent to the new Scottish company will be returned within a few days re-inked and ready again for use

Aladdink is offering the service at one third of its normal retail price with a minimum of £1 The company suggests having two ribbons – one for use while the other is away being re-inked

The service is available to anyone by posting a used cassette together with a remittance equal to one third of the price originally paid for it with a minimum of £1 stating the make and model of the printer

ST's inside story

KUMA Software has published its first book for the Atari ST series – The Atari ST Explored

Topics covered include GEM TOS the BIOS ST Basic and Logo An in depth coverage of 68000 assembly code is also included with details on system variables and operating system calls to the BIOS

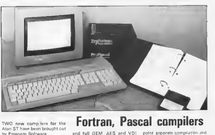
There are also chapters on how to configure the keyboard and using the RS232 interface to connect the ST to printers electronic mail services and other computers

Sales manager Jon Day said It is written in very readable style illustrated with diagrams and examples For anyone wanting to learn about the capabilities of this advanced micro system it is essential reading

Price £8 95

RACE GAME

A FAST action car racing game Major Motion has been released for the Atari ST by Microdeal It will cost £19 95



Fortran, Pascal compilers

TWO new compilers for the Atari ST have been brought out by Prospero Software

ProFortran-77 can be used to compile programs transferred from minis or mainframes and uses the existing library software

It has 7 and 16 digit precision floating point 4 byte integers and full GEM AES and VDI bindings to take advantage of the GEM user interface

ProPascal is a complete ANSI 770X3 97 standard Pascal compiler with extensions including strings 7 and 16 digit precision floating point separate compilation and 4-byte integers

Turbo source code will port to the Atari with minor modifications

Each costs £129 and comes with a 230 page manual Neither is copy protected

Ataris are beach pavilion attraction

A SEASIDE cafe overlooking a magnificent view of Anglesey in North Wales is the unusual setting for Britain s newest and probably smallest computer club

Retired amusement machine engineer Harry Trew 62 years young set up the club which uses two 800XLs in the beach pavilion and cafe at Llanfairfechan near Conwy a month ago

About five years ago I became interested in a computer using it to do my cafe accounts Now I have retired I thought it a good idea to encourage youngsters and grown ups to use the cafe as a base for swopping computer knowledge said Harry

The nearest other club is at Colwyn Bay about 15 miles away We only have 18 members at present and about half turn up for the Saturday evening meeting

Luckily two members are local computer experts who bring along their 800XLs to help the youngsters Some are studying for A levels and use the machines for their homework.

After hearing about the little Welsh club *Atari User* contacted Community Computers UK a division of Inter-Action Trust established to help young people make better use of computers

Molly Lowell managing director of Inter Action s computer projects said After you told me about the little club we were only too happy to respond Shortly we will have two handbooks out which will answer all their problems

LISP FOR ST

THE Lisp/ST system a fast and compact version of standard Lisp is now available for the Atari ST from Robinson Systems

It provides a powerful environment for developing and running symbolic programs and includes multiwindow support using GEM Price £59 95

Added to the menu . .

MENU+ has been added to the Metacomco range of programming languages for the Atari ST

It will now be offered along with the latest upgraded versions of Lattice C Pascal and Assembler

As a GEM based command shell Menu+ is a high specification programming environment using pull down menus and the mouse to control programs avoiding complicated command lines

Either single programs or batches can be run and users can add their own tools arguments and options to the menus It provides a history function of previous commands allowing re-execution of commands at a double click and works with any program written for the ST

Price £19 95

Metacomco has brought in an upgrade service Users of its ST programming languages can upgrade to the latest releases at a cost of £10 for each language

urself for action

ONS ARE FOR REAL!

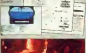
SILENT SERVICE

THE FIRST AUTHENTIC SUBMARINE SIMULATION!

Exciting action, great strategy detailed graphics and an ultra realistic simulation of a World War II U.S. submarine in the South Pacific

Excellent in every respect" *Zzap 64*

Excellent graphics and meticulous attention to detail make SILENT SERVICE a fascinating diversion you'll return to time and time again. *Computer Gazette*



Sid Meier and his team of simulation experts at MicroProse have outdone themselves with SILENT SERVICE a re-creation of submarine operations in the Pacific during World War II As a U.S. fleet submarine skipper, you can almost smell diesel oil and feel the deck rolling beneath your feet while searching the western Pacific for Japanese shipping" *Antic*

AcroJet

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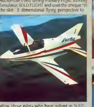
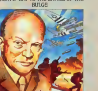


CRUSADE IN EUROPE

FROM D-DAY TO THE BATTLE OF THE BULGE!



This game is a good buy, well presented thoroughly researched and enjoyable to play' *Computer & Video Games Jan '86*

This game is going to set a new standard with an outstanding combination of realism and playability"

'Once again, MicroProse have produced a great product with lasting appeal.' *Your Computer Dec 1985*

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MICROPROSE acknowledged experts in simulations have another on release Silent Service is a realistic American submarine simulation set in the South Pacific during World War II

It offers three types of scenario – torpedo/gun practice convoy actions and war patrols

Torpedo and gunnery practice gives you a swift and gentle way of familiarising yourself with the sub s controls

Control of the sub s functions is handled by a mixture of joystick and keyboard inputs

Although the list of more than 30 commands looks daunting at first sight they have been well thought out and it is surprising how quickly you get to grips with them

The simulation revolves around multiple battle station screens all of which are graphically impressive

The primary battle station is the conning tower This basically acts like a selection menu allowing you to gain access to other screens.

The periscope s black cross-hairs turn white when you locate a vessel the torpedo data computer is then automatically activated and target tracking displayed

Data available includes target identification range, speed and for the benefit of really bright submariners angle on bow and gyro angle

While on the surface the bridge gives you a wide-angled view of nearby islands the coastline and ships.

It also indicates current visibility the bearing of your view and like most of the other screens the sub s heading speed depth and throttle position

The maps and charts screen is something extra special It combines geographic sonar and radar information on a map and shows the location of your submarine (black blob) torpedoes and any enemy ships (white blobs)

And how brilliantly Microprose have implemented this feature On call up you are presented with a superb map of the entire Western Pacific

Even more impressive is what happens when you hit the zoom key – the map is replaced with a patrol map which shows the 500 by 300 mile area surrounding your position

Zoom again and you ll get a navigation map (60 by 40 miles)

Hit zoom once more and there s the most detailed attack map showing an area of just 8 by 5 miles with any ships shown as small tails indicating the direction in which they re moving

You can reverse the whole process by hitting the unzoom key It s all quite stunning

On top of all this there are a range of four skill levels and a variety of reality levels which allow you to customise any situation (limited visibility zig-zagging convoys some dud torpedoes expert destroyers

All this adds up to one heck of a depth and width to the game play

Silent Service has been brilliantly designed immaculately implemented Superb

Bob Chappell

Sound	*8*
Graphics	*8*
Playability	*9*
Value	*10*
Overall	*10*

Wheelie thrills

Program Kik Start
Price £1 99
Supplier Mastertronic 8 10 Paul Street London EC2A 4JH Tel 01 337 6880

THE object of the game is to achieve the fastest time riding a motorcycle over three obstacle courses selected from a set of eight

Obstacles include stationary vehicles water rough ground walls and tyres and each must be taken at an appropriate speed or you will crash dropping to the bottom of the track and remaining at minimum speed to the end of the current obstacle

Speed can be assessed from the changing sound of your motor and is controlled by right/left movement of the joysticks

Wheelies are generated by pushing forward and you can jump by pressing the fire button Pressing the Spacebar pauses the game There is also a high score table

My young users panel aged 7 and 9 took to it immediately and delighted in driving the motorcycles wildly enjoying the animation of the bikes the riders spinning off in crashes the wheelies and the jumps

They were enthralled and did not notice the slightly jerky horizontal scrolling

Once the initial excitement died down the competitive element became apparent and this is the game s real strength

Two players can race on identical tracks one in the top half of the screen and the other below

Overall the game is fun compelling and challenging and with eight different tracks it will take time to attain real mastery

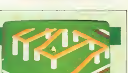
Kik Start will provide entertainment for all computer game fans except expert arcade addicts who might find it too easy

What a pity it is not available on disc

Ian Finlayson

Sound	*7*
Graphics	*8*
Playability	*9*
Value	*8*
Overall	*8*

Bit of a drag race



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Price £1 99
Supplier Mastertronic 8 10 Paul Street London EC2A 4JH Tel 01 337 6880

LOOKING at the graphics on the cassette inlay I was quite impressed by this game However after loading the game s graphics were a bad let down

It appears that this is yet another example of a software house showing screen shots from other versions on the cassette case

Action Biker is based on the lovable character in the KP Skips advert Clumsy Colin

The screen is divided into two sections the bottom part containing information regarding the last object picked up score fuel and so on and the top of the screen scrolls around Clumsy Colin and his vehicle

Although the graphics could not be said to be bad they are not that good either This seems to be the general level of the game – mediocrity

The sound is one thing that is not mediocre It is terrible It includes a painfully grating tune which can thankfully be turned off

You navigate Colin and his bike around the city which contains a fairground a building site and a lake among other things in search of items which will improve the performance of Clumsy Colin s mean machine such as a gear box leather gloves and a crash helmet

After you have collected one item another appears somewhere else The position of these items becomes progressively more difficult to reach until you have to traverse the roller coaster or some scaffolding to reach them

Once you have collected all the objects you take part in a drag race I have not progressed any further than this not because of the game s difficulty but because it has not impelled me to do so

On the positive side the game is very cheap and younger players would probably enjoy it because of its comparatively low difficulty level

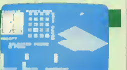
However hardened gamers will probably find that there is no real challenge and will quickly become disinterested

I cannot really recommend this game and my advice would be to give Clumsy Colin as wide a berth as possible

Mark Woolward

Sound	3
Graphics	5
Playability	4
Value	6
Overall	4

Crash on regardless



Program Racing Destruction Set
Price £14 95 (disc only)
Supplier Ariolasoft 68 Long Acre Covent Garden London WC2E 9JH Tel 01-836 3411

RACING Destruction Set to put it at its simplest is Scalextric on a computer

You drive a red vehicle along a slotted track in competition with a yellow vehicle controlled by the computer or another player

The reduced screen is split horizontally with your view of the action in the top window your opponent s (computer or human) in the lower

The basic idea is to belt round the track (straights bends ramps crossovers) an appropriate number of times and finish ahead of your opponent

The graphics are nothing extraordinary – simple but adequate about sums them up Sound effects include engine noises crashes and skids

You can change nearly all the parameters in the game

The gravity can range from one sixth of Earth s so when you go over a ramp you really fly or 2½ times that of the Earth There are no less than 14 settings to experiment with

The number of laps can be anything from one to nine and there are four types of background scenery – racetrack motocross lunar and abstract

And there s more You can choose your own and opponent s vehicle from any of 10 different types – grand prix racer baja buggy dirt bike lunar rover stock car and jeep to name a few

You can customise any basic vehicle since each has its own set of engine sizes and tyre types For destruction play you can also add up to five layers of armour seven layers of crusher power (useful when ramming the opponent) nine gallons of oil (for dropping slicks) and would you believe four landmines (destruction s the right word!)

There is a choice of an incredible 50 differently laid out tracks to race on The names are evocative – killer snake jumps and tiger for example are as tough as they sound Many are modelled on famous racing tracks and roadrace courses

You can also design your own tracks or modify existing ones using a large selection of pieces

The facility is simple to use and any tracks designed can be saved to disc

Given all these features the game is really something special The graphics may be a trifle lacklustre but that s a small point when set beside the wealth of options

There are thrills and spills galore and for sheer versatility the program is unbeatable Pass me the chequered flag – Racing Destruction Set is a winner

Bob Chappell

Sound	6
Graphics	6
Playability	5
Value	8
Overall	8

Hit for a song

Program One Man and His Droid
Price £1.99
Supplier Mastertronic 8-10 Paul Street, London EC2A 4JH Tel 01-337 6880

THE aim here is to navigate a droid through underground caverns to round up a flock of sheep.

On loading the program I was greeted with a bright lively tune better than most found in full-priced games.

To begin the game proper you must first guide your way through a herd of cute little creatures called Ramboids which seem to be a mixture of cast-offs from PacMan and smiling yellow blobs with red cheeks.

At first this section adds to the game, but after a while it becomes a time-consuming annoyance.

The point of the game is to coax all the Ramboids into the teleport receptors in the 20 minutes allowed.

This may sound easy but you also have to transport the Ramboids in a certain order so not only do you have to coerce one particular Ramboid to the teleporter but you also have to prevent any of the others from reaching it first.

The screen is split into sectors containing data on the Ramboids, the droid's status mode and a monitor of what is happening around your well animated and detailed droid.

The droid has three operational modes which can be toggled via the fire button.

Each Ramboid has a set pattern of movement (for which Mastertronic heartlessly call them stupid) and once memorised it makes your task of guiding them much easier.

Once you have rounded up all the Ramboids with at least four in the correct order you progress to the next level. Your task in level 2 is made harder by a plague of mobile brick walls getting in the way. Level three has a more complicated layout to master.

Mastertronic has included several very nice touches – a password for each level, a facility to obtain the position of each Ramboid in the caverns, a well presented high score table and optional keyboard control.

The game's difficulty level is just right to optimise playability and it has very nice colour graphics, a delightful continuous tune and very professional sound effects.

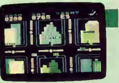
After an indifferent start I have become involved and am now an addict, not being able to leave the game alone.

At £1.99 this is a great value game which will become a massive hit.

Mark Woolward

Sound	9
Graphics	8
Playability	8
Value	10
Overall	9

Out of the Ark



Program New York City
Price £2.99
Supplier Americana Software Parkway Industrial Estate, Heneage Street, Birmingham B7 4LY Tel 021 359 3020

THE idea in New York City is that as a tourist you must visit 12 locations within a certain time. Included on your itinerary are the Empire State Building, Central Park Zoo, the UN Building, World Trade Centre and Grant's Tomb.

More prosaically you must also pay a call to such places as the subway, city hall, bank and post office.

New York is shown on screen in the form of a large scrolling plan of the city. The graphics are very blocky and what you get are large chunks representing different buildings interlaced with roads.

You begin by travelling around the city in a car. If you run out of gas or collide with another vehicle in the fairly busy traffic your car is towed away to the garage lot where storage charges begin mounting up.

Getting the car back means paying bills for storage, gas and repairs.

On foot you are safe from the traffic while on the pavements and can soon reach some of your destinations.

Provided they are open you can enter, whereupon the display will change to reveal the buildings interior.

This is where the game is at its most disappointing. The interiors are graphically boring and all you get to do once inside is play a very simple and crude arcade game.

The most common one is to make your way to the top of a grid of platforms and ladders, grab the prize and exit (ho hum).

In the zoo the game consists of erecting fences around escaped animals (yawn). At the bank you dodge guards and bullets (zzzzz) while at the post office you must grab a letter and try to mail it (snore).

And really that's about all there is to it. You just keep wandering around streets and playing silly uninspiring arcade games for which you either earn or lose money. And keep doing this until your time is up.

Three or four years ago one could have said that this game had some merit. Now though it looks as if it came out of the Ark. Zippy graphics and a wider variety of challenges might have helped redeem it.

In a word, boring. My advice is to either save your money or look at some of the other offerings Americana Softwore have at this price.

Bob Chappell

Sound	4
Graphics	5
Playability	6
Value	5
Overall	5

How Atari breached Poland's Electronic Curt

By TADEUSZ MENERT

THE computer revolution that swept through the West at the end of the '70s and the beginning of the 80s arrived in Poland, with a delay of about three or four years, in the shape of the Sinclair Spectrum

At that time it was the unquestionable ruler of the Polish computer market – and it still occupies quite a respectable position For over three years any other computers that were brought to Poland by people coming back from their visits to the West were scarce and their unfortunate owners tried to get rid of them as soon as it was possible mainly due to the lack of software

Even such well known brands as Commodore Amstrad Apple not to mention our Atari couldn t break through the curtain One must be aware of the fact that a computer can only be useful if there are a certain amount of programs that can be used for both professional and entertainment purposes

What good is a computer for which one could only get an odd few games and nothing else? Can it really serve one s purposes or will it fairly soon degenerate into one more forgotten toy?

Poland does not supply its computer owners with any kind of software from the West You can t just go into a shop and choose out of dozens of available programs Even now the only way to obtain some really good and useful ones is to buy them from the computer clubs here or to exchange the ones that you have for someone else s

At the beginning of the 80s the situation was very much worse Due to the fact that the Spectrum was the most widely used computer here people planning to buy a micro in the West decided on the Spectrum They knew that they would have no software problems whatsoever And they were right

It took them about three years to realise the serious limitations and inconveniences imposed by the Spectrum and this was the beginning of the new period of computerisation in Poland

The change was swift First Commodore then Apple the BBC Micro and other brands began to appear in Poland There was never an *official* import of personal computers into Poland People brought them however from various countries and within months the Spectrum lost its monopolistic position There were even a few earlier Atari products such as the 400 and 600XL

Yet there was no one then who could predict which of all these brands would become a true leader in the field in Poland Most people wanted something new that would shift the balance radically

Then came rumours about the new release by Atari of the 800XL Compared with the Commodore 64 it had better graphics and was to be more reliable It had more memory than Sinclair s Spectrum and other products One needn t buy an interface for printers joysticks and so on

Compared with the earlier Atari products it was more powerful and versatile and it had fewer bugs in its version of Basic Despite that it was compatible with former Atari products which meant that anybody deciding on buying it didn t have to wait months for interesting software

But there was still a danger of buying something that wouldn t become popular here in Poland Some took the risk and I was one of them

I was on holiday in England in 1985 and despite tight finances was positive about buying a computer The chance occurred n August when I visited a second hand shop at Notting Hill Gate and spotted a nice 800XL with a data recorder and three software items for only £73 which was almost half price then

Without hesitation I took it back home to Cracow It took me about a month to locate other Atari users There were about 50 at the time and for the games I had bought I received in exchange five others and became the proud owner of eight games altogether

I played them enjoyed them and learned more and more about my Atari Everything went its own standard way And then came a real shock

For the first time in history Poland bought a batch of Western personal computers – about 500 Ataris plus a certain amount of data recorders disc drives and long awaited software

Why Atari and not Commodore or Amstrad? Well Jack Tramiel is after all of Polish origin born in Warsaw (as far as I know) His Polish name was Jacek Trzmiel

One would think that the software and hardware problem in Poland was over now and to some extent it was

Things need however, a little explanation All this equipment was bought in by Pevex a firm that sells such goods in Poland for Western currencies And that makes a great

r tain

difference The computer plus 1010 data recorder was sold for about $200 and one dollar (on the black market of course as there is no way of buying it legally) costs over 600zl This amounts to over 120000zl

The most popular car in Poland the Fiat 126p costs here about 360000zl If you still can t figure out how much it was let me give you one more number My monthly pay as a teacher of English at the Jagiellonian University is 12500zl No comments A Polish phenomena

If however you think these Ataris were long in the shops you are wrong Within days they were gone Pevex immediately ordered further shipments of 800XLs disc drives, joysticks data recorders and rom cartridges This time they got more then 5 000 computers

Despite their high price micros are desperately needed in Poland They are so much in fashion here that youngsters sell what they can, beg from their parents save money and buy them either in Pevex or for our own currency at the so-called markets which are held in all the major towns in Poland

The Polish government ended all restrictions when it came to individual export or import of personal computers so there is no customs duty to pay

This led to extensive import of Ataris which in turn lowered their price at these markets from over 150000zl to about 120-130000 for a computer with a data recorder This second lot of Pevex-imported computers was also sold within days

In the meantime there was such a huge demand for Atari software that even Pevex couldn t cope But the experiences of the former Spectrum users proved effective

It took our Polish Atarians only a few weeks to organise a club Although it does not act as an official Atari club and does not provide membership cards it serves an important role here being an informal association of all Polish Atari users

Regular meetings are held four times a week in one of Cracow s cafeterias One gains one s membership automatically when one buys an Atari computer and there are no membership charges

So Atari has become a leading computer brand in Poland Of course there are regional differences and in Lublin for example there are only about 50 Atari users, whereas there are over 2000 in Cracow probably due to the location of the Atari club

It is so strange that suddenly people who wouldn t even look at each other a few months ago now meet and talk as if they had been friends for years Before the computer boom I couldn t imagine myself talking about Basic or about some mathematical formulas with a complete stranger and what s more one whose professional interests are utterly different from mine

The gap between the scientific and humanistic minds is disappearing I wouldn t like to suggest that we owe *all* this to Atari although it s quite true in my case

Most of my work can be done now much quicker and much more efficiently with the computer Take translations Before I bought my Atari I had to type and retype the translated text at least three times Now Atariwriter does most of the work for me The same applies to creating tests for my students and writing letters I also never imagined that the adventure games I try to use during my English lessons would be so useful

When a few years ago I read about the revolution in the field of computers and when I kept on seeing all these colourful advertisements of a great number of different brands of computers I was afraid that we would be left far behind the mainstream of modern technology and would occupy some inferior position because the gap between our societies helps the growth of the gap between our technologies

Now I see we have somehow managed to get past this dangerous stage We are still behind that is beyond question but we are moving and this brings hope

No one likes to be last The urge to make up for lost time is so great that there is now not a single magazine or even newspaper that wouldn t publish something about computers

There are even computer-dedicated TV programmes like Halo Komputer and Spektrum radio broadcasts of computer news and programs transmitted on-air

There are whole newspapers dealing only with hardware and software problems like Bajtek Komputer or Mikroklan There are no magazines yet dedicated to a single computer but who knows what will happen within a year?

Taking everything into consideration the prospects for the Atari in Poland seem to look great better than for any other computer here

A lot depends on Atari themselves Will they remain really reliable and keep on supplying good programs? Much depends on Atari users both here and abroad The former must prove that their computers can do more than other machines The latter being far more experienced and having greater access to up-to-date information could provide the Polish Atarians with their ideas and solutions to various problems

I at least am extremely grateful for all the letters and help I have received from Atari users from all over the world – mainly in England and the USA – with whom I got in touch

When I needed them they were there and that is what counts We all do it for fun for pleasure

We deal with the so called artificial intelligence We operate the machine How it is then that we still are human and friendly? Even more friendly and human than before we bought these unhuman machines

Best wishes to all of you! ■

● *Mr Menert would welcome correspondence from other Atari users His address is Tadeusz Menert c/o Grzegorz Wrobel ul Skarbinskiego 10/31, 30 071 Krakow Poland*

Hey Presto! Now things are taking shape on screen

Part Three of STEPHEN WILLIAMSON's series on player missile graphics

WE have already seen how to design a player and convert that design into bit-mapped code that the player missile system can recognise. The program this month illustrates how to initialise the system so that the player shape can be displayed on screen.

Before looking at how the program is constructed it is helpful to be clear about how the Atari keeps track of its memory. It stores information or data in memory locations, also known as addresses. In a 64k computer these are numbered from 0 to 65535.

If in direct mode you type, say, POKE 755,4 then you are storing the number 4 in memory location 755. The number that is stored must be within the range 0 to 255 and is measured as 1 byte of memory. A memory location cannot hold more than 1 byte.

Last month we saw the method of bit-mapping, in which a single number within the range of 0 to 255 can represent a pattern of eight pixels, or a binary number which consists of a combination of eight 1s and 0s. Using this method is one way of working in a binary number system without actually having to program in the binary 1s and 0s which can be very tedious indeed.

Each 1 or 0 occupies 1 bit of memory – so in the player stripe each pixel in the eight pixel row occupies one bit of memory and one row of pixels uses one byte. 256 bytes are known as one page and four pages equal 1k of memory – or 1024 bytes.

If like most of the population you are used to decimalisation this may all sound like the old illogical money system where 12 pence made one shilling, and 20 shillings made one pound. Don't worry, it is not vital to fathom the reasoning behind the Atari's memory number system, but it is important to remember that eight bits equal one byte, 256 bytes equal one page and four pages equal one k (1024 bytes).

Part of the Atari's memory is allocated to ROM (Read Only Memory) which contains the Basic interpreter and the operating system. Other areas of memory are known as RAM (Random Access Memory) and it is the RAM addresses where Basic programs are stored.

The first thing that is required when initialising the player missile system is the reservation of an area of RAM that is not needed by our Basic program, and where the bit mapped data that represents the player and missile shapes can be stored.

In the case of single resolution players this must be a 2k section, and 1k for double resolution. The player missile system must then be informed where this area is so that it can be displayed on the TV screen by means of the GTIA chip. This method of taking information directly from RAM is known as Direct Memory Access, or DMA for short.

The start of this storage area is called the player missile base, or PMBASE for short. In theory we could reserve a 2k or 1k memory area in one of several places within RAM, but in practice it is usually allocated somewhere near the top to avoid clashing with Basic programs that are stored lower in RAM.

To find out where the top of RAM is on your Atari, type PRINT PEEK (106) and press Return. If you own an

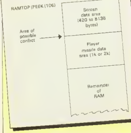

Beginning of ROM
RAMTOP (PEEK (106)
Screen data area (420 to 8136 bytes)
Area of possible conflict
Player missile data area (1k or 2k)
Remainder of RAM

Figure 1: Memory map of RAM with player data area reserved

Graphics Mode	Approximate size in bytes	Number of pages for PMBASE Single res	Below RAMTOP Double res
0	992	16	8
1	672	16	8
2	420	16	8
3	432	16	8
4	696	16	8
5	1176	16	12
6	2184	16	16
7	4200	24	24
8	8138	40	36
9	8138	40	36
10	8138	40	36
11	8138	40	36
12	1152	16	8
13	660	16	8
14	4296	24	24
15	8138	40	36

Figure II Where to put the player missile data area in order to avoid conflicting with screen memory area

800XL you will see the number 160 on the screen This will be different on models with less RAM, such as the 600XL

The number 160 is the end of RAM expressed in pages Immediately above this address is the start of the ROM area where the Atari Basic interpreter resides The page number found in location 106 is known as RAMTOP for obvious reasons

If RAMTOP is 160 its address is 40960 bytes above the bottom of memory – 256 × 160 pages This is 40959 Remember that the Atari counts from 0 and not from 1 as humans tend to do

The player missile data area must obviously be placed somewhere below RAMTOP There are two factors that decide just how near RAMTOP we can go The first is that single resolution data must start on a 2k boundary This means that PMBASE must begin at 8 pages or 16 24 32 and so on below RAMTOP – eight pages being 2k

For double resolution players we need a 1k or 2k boundary – 4 8 12 16 and so on pages below RAMTOP Why the system demands a 1k or 2k boundary I am not sure but Antic has its own rules and we have to stick to them

The other restriction is to make sure that the top of the player missile data area does not conflict with the screen memory area which is also stored at the top of RAM

Figure I is a memory map of the top of RAM when the player missile data area has been reserved, and shows the possible conflict that may occur with the screen area if the player missile data area has been allocated too near the screen

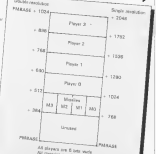
You can generally tell when a conflict has occurred Strange combinations of numbers and letters mixed in with graphic symbols are seen on text screens and odd mixtures of colours and shapes show up on graphic screens This phenomenon is known as garbage

Because no graphics screen occupies more than 8138 bytes – just under 8k – we could always store the player missile data area starting at 40 pages below RAMTOP This is 10k under RAMTOP and would bring the player missile data storage area just below the beginning of the screen memory where there is no danger of conflict

If memory is at a premium – which is especially the case with the 600XL – this can be a problem For example if you are using a Graphics Mode 0 screen which only occupies 992 bytes then you have effectively barred an area of about 7k that lies between the beginning of screen memory and

→

Figure III Player missile data memory map



All players are 8 bits wide
All missiles are 2 bits wide

the end of player missile data which does not leave much RAM left for Basic

If you want to conserve memory refer to Figure II which is a table of how far below RAMTOP the PMBASE need be to avoid conflicting with the different graphics modes.

In the demonstration program we are using Graphics Mode 0 which from Figure II we see needs a PMBASE of 16 pages below RAMTOP in order to conserve memory avoid conflict with the screen and still leave room for over 30k of Basic programs on an Atari 800XL or around 11k on a 600XL Line 60 performs this calculation and gives the PMBASE address to the variable PBM

It is possible to move the screen memory to a different position in RAM somewhere below the player missile data area and allow the player missile area to be closer to RAMTOP Most Basic programs do not require this so it is good practice to stick to the first system to avoid conflict

The player missile system must now be informed of where the PMBASE is Line 700 does this by storing PMB in address 54279 Location 54279 is the place where Antic goes to find out where PMBASE is

The 2k single resolution or 1k double resolution area is divided up into the specific data storage areas for each player and missile Figure III is a map of how this area is allocated All addresses in Figure III are relative to PMBASE

No playfield (switches off screen display)	0
Narrow playfield	1
Standard playfield	2
Wide playfield	3
Enable missiles	4
Enable players	8
Singe resolution	16
Enable DMA (switch on screen display)	32
Default value if no options set (standard playfield enable DMA and two line double resolution)	34

Figure IV Location 559 DMA Control Register

Player/Missile 0	704
Player/Missile 1	705
Player/Missile 2	706
Player/Missile 3	707
Playfield 0	708
Playfield 1	709
Playfield 2	710
Playfield 3	711
Background/Border	712

Missiles normally take the colour of the corresponding player

Figure V Colour and brightness registers

In the program we are displaying a Player 0 shape whose storage area begins at PMBASE plus 1024 and ends at PMBASE plus 1279 an area of 256 bytes The data for the Player 0 shape must be stored somewhere within this area

You will notice from Figure II that the first 768 bytes – or 384 bytes in double resolution mode – of the player missile data area are unused by the system I have no idea why – Antic works in mysterious ways

These free bytes can be handy for short machine code routines that can be used to animate players As long as the system has been initialised correctly the data stored in this free area is protected from corruption I will show how this unused space can be put to advantage next month when discussing animation

The program only deals with Player 0 but setting up the other players is done in exactly the same way as long as you use the appropriate registers

It is good practice to clear the player missile area of any garbage that may have accumulated there otherwise unwanted pixels may light up on the screen Line 90 clears the Player 0 data area with a loop which pokes in zeros

Once the area has been cleared we can start to load the bit-mapped numbers that correspond to our shape into the Player 0 data area How far into the player data area we put the data determines the vertical position within the player stripe when the player is displayed on the screen

If the data is loaded from the beginning of the data area – in other words PMBASE plus 1024 – then the shape will appear at the top of the screen

Line 100 loads the Player 0 shape data commencing 140 bytes beyond the start of the Player 0 data area so that the player will appear 140 pixels down the player stripe or part way down the TV screen

This program leaves room for a 20 row player As we are only using an 11 row design the rest of the DATA statement in line 170 is filled with zeros.

If you have designed your own

Black	0
Rust	16
Red-Orange	32
Dark Orange	48
Red	64
Dark Lavender	80
Cobalt Blue	96
Ultramarine	112
Medium Blue	128
Dark Blue	144
Blue-Grey	160
Olive Green	176
Medium Green	192
Dark Green	208
Orange Green	224
Orange	240

Brightness range 0 to 14 (even values only) Add brightness value to colour value 0 is darkest shade 14 is brightest

Figure VI Colour values to change colour registers

Player 0	53248
Player 1	53249
Player 2	53250
Player 3	53251
Missile 0	53252
Missile 1	53253
Missile 2	53254
Missile 3	53255

A value of 48 in these registers puts the player at the left hand edge of the screen and 208 puts the player on the right hand edge

These values may vary slightly depending on how your TV is adjusted

Figure VII Horizontal registers

player either using graph paper as detailed last month or by means of the Player Designer program, you might like to alter the program and substitute your own bit-mapped numbers in line 170

In line 110 various options associated with the player missile system are switched on by poking address 559 Figure IV is a list of options available To decide what number to poke simply add up the option values

In the program I have set up a standard playfield (2) with enable missile (4) enable player (8) single line resolution (16) and enable DMA (32) – a total of 62

Notice that it is possible to have a narrow playfield as well as a wide playfield To see how this works type in POKE 559 33 – narrow playfield plus enable DMA

Note that the text is in a peculiar position as the screen editor does not automatically adjust for the narrow screen POKE 559 35 gives a wide screen playfield POKE 559 34 returns to a standard playfield

POKE 559 0 turns off all options, including the screen display When this happens GTIA stops displaying the screen and the operating system can now process data approximately 30 per cent quicker This option is useful if you are using a Basic program that is doing a lot of calculating

POKE 559 0 lets the program get on with its calculations at increased speed while you twiddle your thumbs and wait for the thing to finish POKE 559 34 switchs the screen back on to hopefully display the correct answer to whatever task you have set the computer

Even though the demonstration program does not use missiles I have included the enable missile option It is not strictly necessary but it does no harm The program is designed to represent a standard player missile initialisation, adaptable to many other situations where you need to set up the system

Line 120 sets the colour of the player The memory locations associated with player missile graphics are often called registers Figure V is a list of the colour registers and the values that can be poked into them are listed in Figure VI.

In line 120 the colour chosen has a value of 204 which is made up of medium green (192) plus a brightness level of 12 This number is then poked into location 704 the colour register for Player 0

Line 130 sets the horizontal position of the Player 0 stripe to 140 so that the player will appear near the centre of the screen Try altering line 130 to a different value – between 0 and 255 – and see what happens

Figure VII gives the horizontal registers for the other players and missiles It is important to set the horizontal register If not set the register value defaults to 0 which means that the player stripe is so far to the left as to be actually off screen

Now all that is required is to throw the switch that turns on the player missile graphics This is done in line 140 by POKE 53277 3 Voila – the bug appears

Three options are available with register 53277 A value of 1 turns on the missiles only 2 turns on the players and 3 turns on both players and missiles Again it is unnecessary to turn on the missiles if they are not needed but I do so as a matter of course

In this program no data has been loaded into the missile data area so no missile will appear and even if some stray bytes of information have crept in because the horizontal positions are still at 0 – their default setting – they will still not appear and spoil the look of the display

As mentioned before the purpose of the demonstration program is to show how to perform a fairly standard initialisation operation for the player missile system

Setting up the system can be a little tricky – forgetting to set one register, or putting the shape data into the wrong area can stop the system working properly

Perhaps the best means of finding your way around the initialisation process is to experiment with the program changing it and adapting it to set up a different player with a different shape colour and position on screen ■

Try displaying more than one player at a time or switch on a double resolution player Trial and error methods often work wonders

● *You will note that the bug does not actually do anything in the program It is pretty lifeless just sitting there playing dead Next month I will breathe life into it by means of animation*

```
10 REM PLAYER MISSILE GRAPHICS
20 REM by Stephen Williamson
30 REM FOR ATARI USER
35 REM PM INITIALISATION
40 REM PROGRAM 1 - PART 1
50 GRAPHICS 0:SETCOLOR 2,0,0:POKE 755,
0
60 PMB=PEEK(106)-16
70 POKE 54279,PMB
80 PMBASE=PMB*256
90 FOR J=0 TO 255:POKE PMBASE+1024+J,0
:NEXT J
100 FOR J=0 TO 19:READ A:POKE PMBASE+1
024+100+J,A:NEXT J
110 POKE 559,62
120 POKE 704,204
130 POKE 53248,140
140 POKE 53277,3
150 GOTO 150
170 DATA 40,186,214,254,214,254,238,10
6,170,56,16,0,0,0,0,0,0,0,0,0
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	15705	20	16918	30	24498
35	15268	40	14570	50	6365
60	2770	70	2865	80	2982
90	7735	100	9433	110	1972
120	2090	130	2560	140	2136
150	3622	170	9902		

American $cene

EDWARD SHARK reports

THE Sunshine State is the source of new software this month Florida is the home of Disneyworld Miami Vice the Everglades and Scott Adams of Adventure International

Scott is about to release his first title for the Atari ST in the form of Spiderman I am not the greatest fan of Adventure International as I don t think they have really advanced in the field of software design

* * *

Apart from the scrolling graphics controlled by the mouse Spiderman does not look that much different from the 8 bit version

I would not pay money for this title Although it works in both mono and colour the mono hi res mode is very disappointing

For lovers of Print Shop on the XL/XE Unison have produced a very similar program on the ST called Printmaster which will design letterheads banners and signs

You can print in a range of font styles and there are a large number of pictures which can be incorporated into your design You may also design your own pictures and store them on a data disc At $39 95 this is a very useful package indeed

* * *

Moving back to Print Shop news of a new data disc has just arrived although no other details are available apart from the price which is $9 95

Microprose Software has released a war game simulation for the ST called Conflict in Vietnam as part of their new command series This simulation gives you the option of taking charge of either the free world or the communist forces

Activision have finally released the long awaited Music Studio but you will need a colour monitor to run it

The package contains a music paint box where you may doodle with notes and experiment with different compositions The program can drive the Midi interface which will allow you to connect your synthesiser to the ST

When you have completed the composition you can even add lyrics and save the lot to disc This application could be ideal for educational purposes Activision UK should have it ready soon and it will only cost you $49 95

It is a comfort to see that it is not only American software that is being distributed in the States the Brits have landed as well

Software written in the UK is making a significant impression on the market Laser Software International have managed to score heavily with Laserbase and Mastertronics and Firebird are doing well

* * *

Because the ST is a relative newcomer we do not often see the real top end business applications programs However Abacus of Michigan has written a very powerful electronics design tool PC Board Designer a true CAD program

Enter your design parameters and the computer will modify them for you You may position components by using the mouse and move them around to make them fit into the best position

The most powerful feature of the program is the tracing aspect where the computer will draw the tracks of a pcb very accurately

At $339 99 it is not a program that everyone will clamber for but it sure will be an advance for the ST

I received an interesting call from Chicago this morning from a company new to the Atari scene Mark Williams Co They have been producing software for the Macintosh and have now turned to its rival the ST

They have two titles ready for release The first is a C compiler purported to be the best thing since salami and rye and they will also be marketing a new language called Coherent

Not much is known about these titles but I should have more details next month

Action Software Supplies a new distributor of ST software in the UK has negotiated a deal with a number of small software houses in the States to import products which would not normally be seen over here

* * *

The programs range from games to specialist business applications Details are scarce at present but news should break soon

A metamorphosis has taken place with two titles from the 8 bit stable Joust and Battlezone have been converted to run on the 520/1040

Atari is the culprit but I am very happy to see my favourite game Joust on the new machines

The game play is similar to that on the old machines and the enjoyment is as it was when I first booted these programs from my 810 disc drive The prices are reported to be $39 95 each

* * *

On the 8 bit front Beach Head 2 from Access should be winging its away across the ocean soon and it won t be long before US Gold has a cheaper UK version available This is no different from the version that was released for the Commodore 64 and Sinclair Spectrum over a year ago

My advice would be to wait for the US Gold version rather than pay about £35 for the imported one

Some new titles to look for are N Vision by Activision Rogue from Epyx and Universe II from Omnitrend- More details next month

SPACE MAZE

By STEVEN DAVIES

THIS month's game takes us once more into the realms of outer space. Your task is to pilot a small one-man spaceship around the hazards of an alien planet.

There are four stages, each a little harder than the previous one. First manoeuvre your ship between the rocky outcrops into the cavern below.

You may consider collecting some fuel as you go – you'll certainly need it later!

Next you must navigate the tunnels – but don't hit anything – down to the next level. Again, don't forget that vital re-fueling point.

In the third level you have to steer your way around the asteroids and down to the fuel point. But where do you go from there? There is only one exit, and only one way to it.

The fourth level is the hardest of all, and we're not giving you any hints.

Controlling your ship is simple. Push left or right on the joystick to steer, and forward to use your main engines to go up.

You can give a quick burst on the main engines to stop moving left or right, and gravity will always pull you down if you don't do anything else.

The game is written in Basic, with a machine code routine to move the spaceship player vertically. The screens are drawn, using a redefined character set, in Antic Mode 4, which allows for all the colours required.

Make sure that you type all of the numbers in any DATA statements exactly as printed, or you may crash your machine and have to start again. Always ensure you have saved a copy before trying to run it.

Be especially careful when typing in the ? statements in lines 1370 to 2330. Make sure you get the right number of spaces so that the ends of the lines in each of the four blocks match up with each other.

We have printed these lines slightly wider than normal to help you to see the spacing better, but don't forget that they will overlap on to TWO screen lines on your TV set.

You will find de-bugging much simpler if you can run a printout in 80 column format to see the whole line at once. If you don't have a printer, try typing POKE 82,0 to set the left screen margin to zero, thus showing you two more characters per line than normal. (This is a good tip for typing in those "long" lines in programs which just don't seem to fit.)

The checksum will always let you know if you have made any mistakes. ■

```
1 REM ********************************
2 REM ******** SPACE MAZE ********
3 REM ***** BY STEVEN DAVIES *****
4 REM ***** WRITTEN: 12/1/88 *****
5 REM * (C) ATARI USER JULY 1988 *
6 REM ********************************
10 GRAPHICS 0:POKE 752,1:POKE 710,0:PO
SITION 3,10:? "PLEASE WAIT-INITIALIZIN
G 40 SECONDS " FOR TI=1 TO 900:NEXT TI
20 XX=120:YY=S:GD1=0 G1:GD2=0 G1:GP=0.
6 MOVE=11:FUEL=150:HITCL=53278:HIT=532
52:LIFE=3:GI=0.01
40 POKE 559,0
50 GOSUB 710:REM [illegible]
60 GOSUB 2110:REM [illegible]
70 REM *******MAIN LOOP***********
80 XX=120:YY 26:POKE PLX+1,F1:POKE PLY
+1,F1:GP=0 0 POKE HITCL,0:POKE 752,1
90 POKE 760,C01 POKE 709,C02 POKE 712,
C04:POKE 700,COLET/260:POKE 764,9
110 POSITION 0,0:? "F-":POSITION 2,0:?
 FUEL:POKE 559,62
120 S=STICK(0):XX=XX+(S=7 OR S=6)-(GD1-
(S=11 OR S=10)+GD2
165 YY=YY-(S=14)+GP
150 POKE PLX,XX:POKE PLY,YY:POKE PDIO,
MOVE:GP=GP+G1
160 IF S=11 OR S=10 THEN GD1=0 4 GD2=0
.01:MOVE=60:SOUND 0,190,0,0 REM [illegible]
170 IF S=7 OR S=6 THEN GD2=0 4 GD1 0 0
3:MOVE=15:SOUND 0,150,0,0 POKE 77,0:RE
M [illegible]
180 IF S=14 THEN GD1=0:GD2=0:GP=GP-0.0
6:MOVE=40:SOUND 0 150,0,0 REM [illegible]
190 IF S=15 THEN MOVE=11 SOUND 0,0,0,0
200 IF MOVE)11 THEN FUEL=FUEL-1 POSITI
ON 2,0:? FUEL;" "
210 IF PEEK(HIT)<>0 THEN GOSUB 340 REM
 CRASH ROUTINE
220 IF  GOT FUEL THEN GOSUB 340
230 IF PEEK(53261)<>0 THEN GOSUB 390:R
EM CAN-ROUTINE
240 IF PEEK(53262)<>0 THEN 640:REM END
 OF GAME
280 IF XX>150 AND YY>195 THEN POSITION
 24,10 ? "   ":POSITION 24,11:? "   "
POSITION 23,10:? "  "
290 IF YY>ERY AND XX>ERX THEN ? "[illegible]" PO
KE 559,0:POKE PLX,220:POKE PLY,20:GOSU
B SCREEN
290 IF XX<42 THEN XX=42
295 IF XX>200 THEN XX=200
300 IF YY<5 THEN YY=6:GP 0.5
310 POKE HITCL,0:GOTO 120:REM MAIN LOO
P END
320 REM *****CRASH ROUTINE**********
340 POKE PDIO,55 SOUND 0,250,8,15:SOUN
D 1,260,2 60
350 FOR T 1 TO 100:POKE 704,T:NEXT T
360 SOUND 0,0,0,0 SOUND 1,0,0,0:POKE P
LX,120 POKE PLY,20 LIFE=LIFE-1
370 IF LIFE=0 THEN GOTO 510
380 FUEL 150 GOTO 80
390 REM ******LANDING ROUTINE*******
400 IF PEEK(53261)<>0 AND GP)0 6 THEN
 RETURN
410 FOR SU=55 TO 0 STEP -3:SOUND 0,5,1
0,SU NEXT SU
420 FUEL=FUEL+10 SC=SC+2:POSITION 2 0
T FUEL
430 IF FUEL)100 THEN POKE PDIO,11:GP=-
0 4:RETURN
440 FOR T=1 TO 50:NEXT T
450 GOTO 460
460 REM ************************
470 GR=0 GRAPHICS 0:POKE 559,0:GOSUB 2
150
472 POKE 710,74:POKE 709,74 POKE 709,0
480 POSITION 15,1:? GR,"SPACE MAZE"
490 POSITION 12,2 ? GR;"BY STEVEN DAVI
ES"
500 POSITION 12,8:? GR;"PRESS START KE
Y"
510 POSITION 12,8:? GR;" TO PLAY GAME"
512 POSITION 2,12:? "/‾‾‾\"
515 POKE PDIO 11 POKE 559,62:FOR T=1 T
0 500 NEXT T SOUND 0,100,0,0
517 FOR T=200 TO 61 STEP -1:POKE PLY,T
:NEXT T
518 FOR T=56 TO 231:POKE PLX,T:NEXT T
519 POSITION 11,2 ? " BY STEVEN DAVIES
 " SOUND 0,0,0,0 POKE 710,10:POKE 708,
14
520 FOR SU=80 TO 0 STEP -1 SOUND 0,5,1
0,SU NEXT SU GOTO 620
530 REM *****END OF GAME ROUTINE***
540 GRAPHICS 1+16 ? GR;"  YOU HAVE FAI
LED   "
550 POKE PLX,0:POKE PLX+1,0:POKE PLX+2
,0:IF SC)HISC THEN HISC=SC G1=0 01
570 POSITION 4,6 ? GR;" YOUR SCORE=";S
C
580 POSITION 4,8:? GR," HIGH SCORE=";H
ISC
590 POSITION 2,22:? GR," PRESS START K
EY "
600 GOTO 620
610 REM ****************************
620 IF PEEK(53279)=6 THEN LIFE=3 SC=0
FUEL=150:GOTO 1380
630 GOTO 620
640 REM *****COMPLETED MISSION****
641 POKE PLX,0 POKE PLY,0
642 FOR T=1 TO 250 POKE 712,T NEXT T
643 GR=4.GRAPHICS 0 POKE 559,0 POKE PL
X,0:POKE PLX+1,0 POKE PLX+2,0 SOUND 0,
0,0,0
645 GOSUB 2100 POKE DL+10,2 POKE DL+0,
6
648 IF SC)HISC THEN HISC=SC
660 POKE 710 12:POKE 708 14 POKE 709,0
665 POSITION 5,2:? " *** WELL DONE **
*"
670 POSITION 0,5:? "   YOU HAVE COMPL
ETED YOUR MISSION   "
680 POSITION 7,8 ? "YOUR SCORE=";SC,:?
 "  HIGH SCORE=";HISC
690 POSITION 4,11:? " GOOD LUCK ON YOU
R NEXT MISSION"
691 POSITION 12,14 ? "PRESS START KEY"
:POKE 559,62:GI=0 02 POKE HITCL,0
700 GOTO 620
710 REM INITIALIZE VERTICAL BLANK
720 FOR I 1510 TO 1700 READ A POKE I,A
 NEXT I
730 FOR I=1774 TO 1787 POKE I,0 NEXT I
740 REM SET PMBASE AND CLEAR PLAYERS
750 PM=PEEK(106)-16 PMBASE=256*PM
760 FOR I=PMBASE+1023 TO PMBASE+1647:P
OKE I,0 NEXT I
770 FOR I PMBASE+1028 TO PMBASE+1033 R
EAD A:POKE I,A NEXT I
780 FOR I=PMBASE+1281 TO PMBASE+1281:R
EAD A:POKE I,A NEXT I
790 FOR I=PMBASE+1557 TO PMBASE+1562:R
EAD A:POKE I,A:NEXT I
800 RESTORE 1030 FOR I=PMBASE+1 TO PMB
ASE+61 READ A POKE I,A NEXT I
810 PLX 53248 PLY=1780 PLN=1284
820 POKE 623,1 POKE 1780,PM+4 POKE 532
77,3 POKE 54279,PM
830 X=USR(1536)
840 REM ***************************
850 PCOLD=704 PCOL1=705 POKE PCOLD 116
:POKE PCOL1,210:POKE 706,118:REM PLAYE
R COL
860 POKE PLN,9:POKE PLN+1,18:POKE 5315
0,0:POKE PLN+2,25 POKE 53256,1:REM PLA
YER HEIGHT & WIDTH
870 POKE PLX 60 POKE PLY,200 REM PLAYE
R 0 INITIAL POS
880 POKE PLX+1,0 POKE PLY+1,0 POKE PLX
+2,0 POKE PLY+2,0:REM PLAYER 1 INITIAL
 POS
890 PDIO=1772:POKE 1771,PM:POKE 53257,
3 RETURN
900 REM VERT BLANK ROUTINE DATA
910 DATA 162,3,189,244,0,240,89,56,221
,240,6,265,81,141,254,6,106,141,256,0,
142,253,6,24,109,0,109,231,0
920 DATA 24,109,252,8,133,204,133,206,
189,240,6,133,203,173,204,6,133,206,16
2,240,0,120,232,60,155,6,140
930 DATA 16,100,177,201,165,205,159,0
166,261,130,201,266,244,70,87,6,160,0
177,203,145,204,169,0,145,203
940 DATA 200,203,204,244,174,253,6,173
,704,0,167,240,8,109,230,6,260,40,133,
203,28,130,141,691,6,109,235
950 DATA 6,153,204,24 171,253,6 189 15
2,6,133,204,189,240,6,111 204,109,246,
6,170,160,0,177,203,165,205 70K
960 DATA 201,260,240,174,251,6,169,6,1
57 230,0,202,40,3,76,2,6,76,98,228,0,0
,100,169,7,152,6,160,0,22,92
970 DATA 228,50
980 REM DRAW PLAYERS
990 DATA 0,0,20,26,24,31,26,26 0,0
1000 DATA 120,231,139,231,229,219,219,
255,255,255
1010 DATA 24,24,120,120,255,255,0,0,26
6,255,60,00,60,126,00 60,00,255,196,25
5,219,126,126,126 60
1020 REM ************************
1030 DATA 0,0,0,0,0,0 0,0 0,0
1040 DATA 24,60,60,00,170,90,195,129
1050 DATA 0,0,157,252,124,00,126,90 19
5,125,0,0
1060 DATA 25,63,02,60,126,90,195,129
1070 DATA 0,0,24,60,00,60,126,90,219,1
89,0,0
1080 DATA 0,0,102,102,94,04,87,90,227
170,0,0
1090 DATA 24,60,60,00,120,90,195,129
```

```
1100 REM ****DATA FOR PM SHAPES******
1110 RESTORE 1140:CHSET=(PEEK(106)-8)*
256
1120 READ C:IF C=-1 THEN 470
1130 FOR J=0 TO 7:READ A:POKE CHSET+C*8
+J,A:NEXT J:GOTO 1120
1140 DATA 97,0,252,223,223,0,255,253,2
53,56,0,0,0,0,32,0,0,0
1150 DATA 99,255,223,247,255,187,239,2
54,255,180,0,0,0,1,7,15,112,255
1160 DATA 101,5,111,255,255,255,248,25
5,253,103,180,246,255,255,255,255,255,
255
1170 DATA 103,120,192,180,240,240,240,
253,255,184,0,0,0,1,17,27,191,255,33,0
,0,0,123,199,247,255,255
1180 DATA 34,0,0,0,129,199,247,255,255
,36,0,0,0,128,227,219,255,255,28,0,0,4
7,191,253,251,223,254
1190 DATA 10,128,193,226,237,188,191,2
51,229,27,0,0,22,180,254,252,228,247
1200 DATA 114,127,127,127,58,90,127,12
7,127,13,255,255,255,7,7,205,240,255
1210 DATA 40,127,127,127,243,143,127,1
27,127,41,255,180,254,007,207,240,255,
254,42,203,208,253,250,255,255,255,255
1220 DATA 43,0,120,224,240,252,252,255
,255,44,240,252,254,7,7,250,255,255
1230 DATA 80,0,1,7,31,63,127,255,255,4
8,1,1,7,15,28,60,233,165
1240 DATA 87,192,193,224,240,80,28,14,
255
1250 DATA 48,251,99,123,77,15,0,0,0,49
 251,223,251,255,255,59,17,0
1260 DATA 51,251,223,239,205,176,7,3,1
 52,251,95,111,77,7,7,3,2
1270 DATA 53,1,7,15,11,63,127,120,250,
54,1,14,11,59,31,5,3,1
1280 DATA 55,251,223,230,197,129,0,0,0
1290 DATA 18,0,180,138,126,138,120,180
,0,17,0,32,32,32,32,12,22,0
1300 DATA 18,0,160,0,160,120,106,180,0
,19,0,160,0,40,0,0,160,0
1310 DATA 20,0,116,130,160,0,0,0,0,21,
0,160,120,180,0,0,180,0
1320 DATA 22,0,160,180,180,136,118,180
,0,23,0,160,0,0,12,32,22,0
1330 DATA 24,0,160,120,160,130,136,180
,0,25,0,180,136,160,0,0,0,0
1340 DATA 53,0,0,0,0,12,0,0,0
1350 DATA 36,0,186,120,160,180,170,120
,0,11,0,0,0,180,180,0,0,0,0,0,0,0,0,0,
0,0,0,-1
1360 GRAPHICS 0:POKE 752,1:POKE 559,0
1370 ?
1380 ? "                              dg   "
1390 ? "                             dcc   "
1400 ? "                  dg        dcccB  "
1410 ? "                 dccB      dccccB  "
1420 ? " defghdefg defghcccE      decccccccg"
1430 ? "ccccccccccccccccccccccJ  Jccccccccccc"
1440 ? "ccccccccccccccccccccccJ  Jccccccccccc"
1450 ? "ccccccccccccccccccccccJ  Jccccccccccc"
1460 ? "ccccccccccccccccccccccJ  Jccccccccccc"
1470 ? " J                        BSTccccc"
1480 ? " J                          BSTccc"
1490 ? " J                            bccc"
1500 ? " J                            dccc"
1510 ? " J                   deg      Scccc"
1520 ? " J  rG              hAcccbgH   cccc"
1530 ? " J  rG            defccccccccB    c"
1540 ? " J  rGL          defcccccccccccB ccc"
1050 ? "BdefGJJJJJJdeccccccccccccccccDC   ccc"
1060 GR.=4:GOSUB 1200
1050 SOUND 1660:EXY 256:FNX=120:Z1=78:Z2=360:C01=18
:C03=12:C04=52:GOTO 60
1060 ? "cccccccccccccccc      cccccccccccccc"
1410 ? "cccccccccccccccc      cccccccccccccc"
1020 ? "cccccccccccccccc      cccccccccccccc"
1030 ? "cccccccccccccccc      cccccccccccccc"
1040 ? "  X      X   X         X X        "
1050 ? " X                 X X          X "
1060 ? " X   X            X           X   "
1070 ? " X        X X X X    X X  X  XX   "
1080 ? " X      X     X  X X      X    X  "
1090 ? " X    X    X          X X X  X    "
1200 ? " X                   X      X     "
1710 ? "                                  "
1720 ? "                                  "
1730 ? "                                  "
1740 ? "                                  "
1750 ? "                                  "
1760 ? "                                  "
1770 ? "                                  "
1780 ? "                                  "
1790 ? "                                  "
1800 ? "                                  "
1810 ? "                                  "
1820 ? "                                  "
1830 ? "                                  "
1840 SOUND 1660:EXY 162:FNY 406 F1=56:F2=104:C01=8:
C02=12:C04=52:GOTO 60
1860 ? " dCDE                dedeg      dCDE "
1870 ? "Vccccg              VcccAB     Vccccg"
1880 ? " ROST  defg     d   BSI      d BSIBS"
1890 ? "       VccccB   Bcg           Bcg    "
1900 ? "        CSDB    BST  defg      BST   "
1910 ? "   cc                VcccB     defg  "
1920 ? "  BcccB             CBSI hb    BcccB "
1930 ? " VccccB  hb   BCE       Vccfg   TBSI "
1940 ? "   DGB   Vccg VcccB  Vgfg    Slcc    "
1950 ? "             SDCE 5DGB  Sccg    VE   "
1960 ? "BE                  VccB      BCE    "
1970 ? "CD                dE    dE      BcccZ "
1980 ? " dBSE  de       VcB  dE        SCDE  "
1990 ? " VcccS VccB     5  dccB    dCBL  dedg"
2000 ? " PCS   BSI dE     VccccB   VccS VccBD"
2010 ? "   D        VcB      55BDB   PcS  BST"
2020 ? "     dEdeg  5   de             p     "
2030 ? "    VcccBB      VccB     BCDB   dEdeg"
2040 ? "     BSI        BSI    VccS  VccBB  "
2050 ? "                       PDS     BST   "
2060 ? "       de        dBeeg         de    "
2070 ? "      VccB      VcccBB       VccB    "
2080 ? "       BSC       BSC  aaaaaaa BSI    "
2090 SCREEN 2310 EXY 260 FNX 80:F1=340:F2 260 C01-12
:C02=12:GOTO 60
2110 ? "cccccc   Lcccccccccccccccccccccccccccccc"
2120 ? "ccccc     cc                          c"
2130 ? "ccD      cc                           c"
2140 ? "cc       cc      ccccccccccccc        c"
2150 ? "cc    Bcc     cccccccccccccccc        c"
2160 ? "cc      cc    ccc         ccc         c"
2170 ? "ccD     cc    ccc         ccc         c"
2180 ? "cc      cc    ccc         ccc         c"
2190 ? "cc    Bcc     ccc         ccc         c"
2200 ? "ccD     cc    ccc         ccc         c"
2210 ? "cc      cc    ccc                     c"
2220 ? "cc    Bcc     ccc                     c"
2230 ? "cc      cc    ccc         ccc         c"
2240 ? "ccD     cc    ccc         ccc         c"
2250 ? "cc      cc    ccc         ccc         c"
2260 ? "cc    Bcc     ccc         ccc         c"
2270 ? "cc      cc    ccc         ccc         c"
2280 ? "cc      cc    ccc         ccc         c"
2290 ? "cc            ccccccccccccccc         c"
2300 ? "cc            ccccccccccccccc         c"
2310 ? "cc                          dg         "
2320 ? "cc     cc                  dccg        "
2330 ? "ccccccccccccccccccccccccccccccccccccccc"
2340 EXY=PS9:F1=56:F2=180:POKE PL4+2,120:FOR A PLY+2,
T1:C01=14:C02=C0:ONG:DE:POKE 710 180:GOTO 60
2350 BL=PEEK(88)+256*PEEK(89)
2360 FOR X=L43,30:FOR T=1 TO 60:NEXT T:FOR BL+2,60:NEXT T
2370 RETURN
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1	4271	2	4918	3	5656
4	5126	5	8862	6	4173
10	21274	30	10810	40	1887
50	2390	60	6247	70	8817
80	13510	90	12482	100	2554
130	9527	140	2935	150	9761
160	14455	170	10640	180	12905
190	8274	200	5829	210	11854
220	4791	230	11164	240	11727
250	10129	260	15499	280	7496
290	3942	300	4640	310	12181
320	10264	340	8290	350	5948
360	12145	370	4587	380	2992
390	11493	400	7205	410	8822
420	8191	430	8806	440	3645
450	1614	460	12751	470	6953
472	8836	486	3827	490	7136
500	8927	510	8244	512	3355
515	11177	517	7757	518	8270
519	12509	520	10216	530	18025
540	7874	550	11205	570	6917
580	7083	590	7156	600	1824
610	4051	620	9142	630	1024
640	16387	641	4421	642	8982
643	14845	645	8368	646	4812
660	5800	668	8170	670	13895
680	10538	690	9740	691	12721
700	1824	710	15880	720	7144
730	6231	740	10879	750	5500
760	8868	770	10166	785	10176
790	10187	800	12197	810	8880
820	9352	830	2897	840	4863
850	10787	860	24785	870	17817
880	22437	890	8116	900	5462
910	15190	920	15151	930	15148
940	15174	950	14892	960	15141
970	1315	980	3102	990	4879
1000	7811	1010	11735	1020	3641
1030	2772	1040	4828	1050	8624
1060	4842	1070	6117	1080	6158
1090	4828	1100	5410	1110	5560
1120	4334	1130	10741	1140	8289
1150	5896	1160	11495	1170	14383
1180	13812	1190	10704	1200	10715
1210	16849	1220	10452	1230	8667
1240	5612	1250	9339	1260	8885
1270	8388	1280	9101	1290	9122
1300	8735	1310	8911	1320	9138
1330	9259	1340	7826	1350	11817
1360	7688	1370	284	1380	4359
1390	4413	1400	3868	1410	6417
1420	9785	1430	10874	1440	10594
1450	10834	1460	7979	1470	5052
1480	5172	1490	3180	1500	5277
1510	6901	1520	6720	1530	8882
1540	8661	1550	10777	1560	2915
1580	12792	1600	10442	1610	10442
1620	10842	1630	10447	1640	4858
1650	4850	1660	4858	1670	5826
1680	9522	1690	5738	1700	4828
1710	16260	1720	15781	1730	15590
1740	22518	1750	17085	1760	16885
1770	16555	1780	11811	1790	10189
1800	19681	1810	10555	1820	10748
1830	22724	1840	12717	1860	8228
1870	7669	1880	7332	1890	8181
1900	6224	1910	8180	1920	6729
1930	7659	1940	7961	1950	6142
1960	5581	1970	6774	1980	6747
1990	8072	2000	8510	2010	8547
2020	5742	2030	7412	2040	6842
2050	5182	2060	6728	2070	8338
2080	7028	2090	11410	2110	11688
2120	8847	2130	5404	2140	11918
2150	12387	2160	7845	2170	7717
2180	8185	2190	6415	2200	9125
2210	8785	2220	9815	2230	10855
2240	9297	2250	9285	2260	9415
2270	9281	2280	9288	2290	11918
2300	7865	2310	5178	2320	5881
2330	12810	2340	16977	2350	4456
2360	9867	2370	1458		

Get switched on!

Part 2 of LEN GOLDING's series on

controlling gadgets via your Atari

LET'S look at how to get useful signals out of the joystick ports and how to amplify them so that they can switch external appliances on and off under software control.

With the power switch described you can make animated models, control a train set, drive low-voltage disco lights or operate equipment designed for use in car, caravan or boat.

The switching action can be controlled directly by your software, manually from the keyboard or by an external sensor such as the light-activated switch described last month.

First let's look in detail at setting up the joystick ports. Each one has four signal lines – pins 1 to 4 – which can be made to behave as outputs by Program I.

Line 10 notifies the computer that you are about to change the way ports 1 and 2 are handled, line 20 specifies that all eight signal lines are to be treated as outputs and line 30 sets 54018 back to its original value, with the new rules operational.

Line 40 clears the switch register, making sure all the signal lines are off. From then on, any number you poke into 54016 will appear as a pattern of high – on – and low – off – voltages on the output pins of ports 1 and 2.

Table I shows the numbers to poke for all possible on/off combinations at port 1. Each line has its own unique number – 1, 2, 4 or 8 – and by adding these numbers together in different combinations you can control each output independently.

Numbers higher than 15 will bring port 2 into operation. Pins 1, 2, 3 and 4 in this port are controlled by 16, 32, 64 and 128 respectively, as shown in Table II, and these numbers can be combined as before.

For example POKE 54016,195 – or 1+2+64+128 – will switch on pins 1 and 2 at port 1 together with pins 3 and 4 at port 2. Similarly POKE 54016,150 – or 2+4+16+128 – will switch on pins 2 and 3 at port 1 and pins 1 and 4 at port 2.

Any pin which is not specifically selected will automatically switch off when you poke a new number into 54016.

When a pin is on it carries 5V and will supply 0.5mA. When it goes off the voltage drops to 0V, but it can pass 15mA in this state.

You can't do much with such tiny signals, and in any case it isn't wise to connect loads directly to the joystick port. But both of these problems can be overcome by using a transistor.

There are many different species of transistor, but for the moment we'll concentrate on the bipolar kind, which come in two varieties – PNP and NPN. Figure I shows the circuit symbols for both, together with the pin-outs for the two types we'll be using.

Both types have three leads – collector, base and emitter. In each case a small current flowing through the base will enable a much larger current to pass between collector and emitter.

The current can flow only one way – from positive to negative in the direction of the arrow – so it doesn't behave exactly like a switch, but the effect is similar.

A PNP transistor turns on when its base voltage is at least 0.6V lower than its emitter voltage, whereas the NPN variety needs the base to be at least 0.6V higher than its emitter.

Actually it's a lot more complicated than that, but we don't want to get into transistor theory at this stage.

Figure II shows how you can use an NPN transistor as a simple current amplifying switch. The load is a light-emitting diode – those small red

→

```
10 POKE 54018,56:REM Set up Port Control
20 POKE 54016,255:REM All Pins as Outputs
30 POKE 54018,60:REM Re-set Port Control
40 POKE 54016,0:REM Switch all signal lines off
```

Program I

Number in 54016	Port 1			
	Pin1	Pin 2	Pin 3	Pin 4
0	Off	Off	Off	Off
1	On	Off	Off	Off
2	Off	On	Off	Off
3	On	On	Off	Off
4	Off	Off	On	Off
5	On	Off	On	Off
6	Off	On	On	Off
7	On	On	On	Off
8	Off	Off	Off	On
9	On	Off	Off	On
10	Off	On	Off	On
11	On	On	Off	On
12	Off	Off	On	On
13	On	Off	On	On
14	Off	On	On	On
15	On	On	On	On

Table I Output switching

	Port 1				Port 2			
Pin number	1	2	3	4	1	2	3	4
Control number	1	2	4	8	16	32	64	128

Table II Switch control numbers

lamps on your keyboard cassette recorder and disc drive are LEDs – and its only purpose is to indicate on or off

When pin 1 goes to 5V the transistor switches on allowing current to flow through the LED Nearly all the power comes from pin 7 – less than half a milliamp is required at pin 1 – and the transistor acts as a kind of buffer protecting the signal line

Because they are so small transistors and LEDs can be very fiddly to wire together especially if you re not too happy about soldering

The easiest solution is to use a solderless breadboard like the one in the photograph Each hole contains a spring loaded electrical contact which can grip a wire or a component lead

The contacts are connected together in rows of five, and there are longer strips of interconnected sockets at the edges for use as power supply lines You simply plug components into the breadboard and take wire leads from the adjacent holes

Screw the breadboard on to your plywood base and wire everything together as in Figure III Use single-conductor insulated wire – not the stranded type – as the bared ends will push into the breadboard holes more easily and you won t get broken strands coming off inside

The LED won t work if it is fitted the wrong way round – the cathode is indicated by a flat on the LED body and also by a shorter lead Run Program I then type

```
POKE 54016,1
```

and the LED will light

Atari s technical reference notes specify a maximum current drain of 50mA from the joystick ports and you must not exceed this under any circumstances

In fact the internal power supply starts showing signs of distress at about 20mA so it s best to keep at or below this level if possible

Therefore to drive anything worthwhile you will need an external power source capable of delivering higher voltages and currents A battery or a power supply unit will do and 12V is sufficient for all the gadgets we ll be describing this time

A BC108 transistor can t handle more than 100mA so an extra amplification stage is needed The circuit in Figure IV shows how to add a second much more powerful transistor

When TR1 switches on it supplies base current to TR2 which in turn handles all the power for the load

If anything should go wrong with the battery circuit the two transistors prevent high voltages getting back to the joystick ports so the risk is minimised

The output of this switch is in

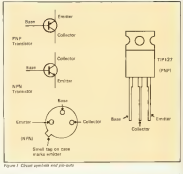


Figure I Circuit symbols and pin-outs

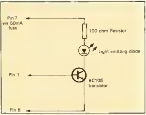
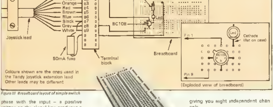


Figure II Simple transistor switch



Colours shown are the ones used in the Tandy joystick extension lead Other leads may be different

(Exploded view of breadboard)

Figure III Breadboard layout of simple switch

Solderless Breadboard

phase with the input – a positive voltage on the signal line produces a positive voltage at the collector of TR2

If the load is an electromagnetic device – such as a relay solenoid or motor – it will generate high voltage spikes on the power lines which could damage the output transistor

The diode D1 is used to suppress these and it must be wired as shown with cathode to positive or it will self-destruct The case has a black or coloured band to mark the cathode end

Figure V shows how to wire everything up without soldering using a miniature terminal block The transistor leads are quite short so you will need the smallest block you can find – not more than 8mm between terminals

Be extremely careful when bending the leads of the TIP127 They have a flat cross-section and will break very easily if you try to bend them across their width but a half-twist will help them round the corners

The power transistor is rated at 5amps but it gets very hot when controlling 1 amp or more so some form of heat sink is necessary

The twisted vane type is adequate for loads up to 2 5 amps (25 watts at 12V) but heavier loads require larger heat sinks – a 5°C per watt type will enable you to draw up to 5 amps

You can buy one of these or make your own from a piece of scrap aluminium – about 50 square centimeters of 3mm plate or angle should be adequate

A touch of silicon grease will improve the thermal contact but isn t strictly necessary so long as the surfaces are clean and the transistor is bolted down securely

Because the first transistor places such a small load – about 1mA – on the joystick port you can have a power switch on every signal line giving you eight independent channels

Now we have something really useful You could construct animated Lego or Meccano models moving displays for shop windows or even simple robots

You could control up to eight separate tracks – or points switches – on your model train set and program the whole layout like the London Underground

A safe disco display for children can be made from 21 watt car indicator bulbs Or you might use 12V pumps or solenoid valves to constuct an automatic watering system for your conservatory

Remember though that the exter-

→

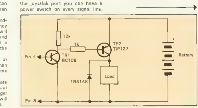


Figure IV Low voltage power switch

nal power source must be able to supply enough current A car battery charger is worth trying or you might use an old car battery itself

Take the usual care to avoid sparks and excessive currents which could start a fire Under no circumstances should you attempt to connect this circuit straight to the mains

The power switches can be operated by external sensors rather than a fixed program We'll be describing many different kinds – temperature sound humidity movement and others – in a future issue

For now you could try the cadmium sulphide cell we looked at last month Wire it between pin 9 and the free end of the 50mA fuse then use Program II to switch the load on when it's dark and off again when it's light

Line 20 sets the switching threshold L and you can reverse the action by changing the > at line 40 to <

```
10 POKE 54018,56:POKE 54016,255
20 POKE 54018,60:POKE 54016,0
30 L=0:REM Threshold value
40 IF PEEK(624)>L THEN POKE 54016,1:GOTO 40
50 POKE 54016,0:GOTO 40
```

Program II

You could use this device to set an intruder deterrent system into operation at dusk How about a gadget which switches low-voltage lamps and and off in random patterns to give the impression that your house is occupied while you are away?

A word now about buying all the necessary bits and pieces which can be a problem especially if you are relatively new to the game It's all too easy to pay over the odds or end up with the wrong thing since components which look alike may have totally different specifications

For things like transistors resistors and other small components the easiest and safest method is to use one of the big mail order companies

They all produce catalogs – some better than others – containing photographs and specifications

We've tended to quote order codes from Maplin Electronic Supplies because they are among the less expensive quality suppliers and their catalog is readily available from W.H Smiths Other mail order companies

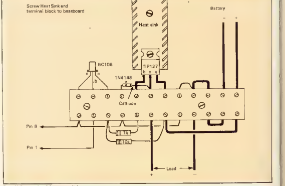


Figure V Construction of the power switch

advertise regularly in the monthly electronics magazines

Some High Street audio stores such as Tandy also supply a limited range of electronic components

They are useful for certain unusual items like the joystick extension lead or for things you need in a hurry but you ll usually pay more for them and the shop assistant is unlikely to be very knowledgeable

Try your local scrap yard for bargains in 12V electro-mechanical equipment such as windscreen wiper motors door-locking solenoids and headlamp relays

Caravan camping and boat shops can also supply a wide range of suitable gadgetry and most electronics magazines advertise surplus and ex-equipment devices which are fine for low voltage experimentation

How about mains appliances? Transistors cannot handle the very high voltages and currents involved so you can t use the circuit of Figure IV to switch on your electric blanket control your central heating or turn the TV off when you ve fallen asleep over the keyboard

Besides which you and your computer need much more protection from mains AC than from low-voltage DC circuits

● *Next month we ll start talking about constructing an opto coupled mains switch box, with two independent channels* ■

PARTS LIST

1 battery 6V to 12V with clips to attach leads 1 5mm (Red) light-emitting diode (Maplin WL27E Tandy 276 041) 1 Verobloc solderless breadboard (Maplin YL11M) 1 BC178 transistor (Maplin QB32K) 1TIP127 transistor (Maplin WQ74R) 1 1N4148 diode (Maplin QL60B) 1 high-power twisted-vane heatsink (Maplin FG65K) 1 cadmium sulphide cell ORP12 or similar (Maplin HB10L Tandy 276 116) 1 joystick extension lead (Tandy 276 1978) 2 small terminal blocks (Radiospares 423 166 or similar) 1m single-conductor connecting wire up to 0 6mm core diameter 2m 5amp low-voltage flexible wire (car accessory shops)

0 25 watt carbon resistors (colour codes in brackets) 1 100 ohm [brown/black/brown] 1 1k (1000 ohms) [brown/black/red] 1 10k (10 000 ohms) [brown/black/orange]

Lost for words in a far from friendly manor

By Brillig

LAST month I promised to have a look at the adventures of Jym Pearson, but before I do that a quick round up of adventure news.

At last now courtesy of US Gold come the Thing and the Human Torch in Questprobe III by Adventure International alias Scott Adams If my review copy has reached me in time then I shall be looking at that one next month

The same applies to The Price of Magik from Level 9 the follow-up to Red Moon The poster boasts even more improvements in the number of locations independent characters and spells you can cast Also it claims very few bugs Brillig s glitch hunters keep even the best on their toes!

Bally Hoo from Infocom sends you on a quest to save the daughter of a funfair owner from who-knows what and should be up to the normal superlative Infocom standard That is another feature for next month s round up of new goodies

Finally I had a nice play with an ST the other day and thoroughly enjoyed Borrowed Time from Activision a very good graphic adventure where you play a private investigator in trouble with some villainous characters

I enjoyed using the mouse to select words and objects – much easier than typing them in – but the advertised price £49 95 seems a bit steep for a game

Now on to a request from A R Morris about the games of the aforementioned Jym Pearson Do I know of any others apart from Escape from Traam and Curse of Crowley Manor?

Of course I do But first for the uninitiated a quick look at the two games he mentions

Crowley Manor is my favourite Pearson offering released by Adventure International a few years ago In it you play a Scotland Yard detective travelling to a mysterious manor where all sorts of grim and gruesome discoveries are to be made

As with all of the Otherventure series the layout is very simple and highly irritating Visible objects appear at the top a location description in the middle (next to the title) followed by your inventory and at the bottom of the screen a space for messages

The vocabulary is extremely limited compared with today s games which probably explains why it will fit into the 16k Atari 400 For instance Get is understood but Take is not. All this might lead the player to believe that I don t understand is on constant display in the message area

Despite the seemingly simplistic vocabulary the games compensate by having some very obscure commands too In Crowley Manor although *Climb cab* gets you into the cab it will take *Get out* to do precisely that. One experienced adventurer I know spent several weeks trying to do just that without succeeding

With the above proviso, the game has a good atmosphere considering the brief descriptions and there is plenty to explore

Exploration in these games is something else, however I can forgive an adventure writer almost anything but to write games with no directions displayed is downright painful

The most tedious part of these games is the fact that you cannot just glance at the screen to see which way to go Pure navigation should not be part of the mystery!

Escape from Traam is a game which I never really got into The scenario in which you have crash landed on a planet and have to escape never gripped me enough to believe in it and the limited vocabulary finished me off

The game employs a technique used quite a lot in this series After a few moves the ship crashes no matter what you do and you are flung clear Frankly I wish I d gone down with it

In San Francisco 1906 the random event turns out to be an earthquake (historically accurate if nothing else) At the time you are locked in your hotel bedroom with a ransom demand a wad of bills and a crowbar which is incapable of prizing open the door or window of the room – yet is able to get you out of the rubble after the earthquake

Quite what you are doing with a crowbar under your bed I have no idea. Within a few locations of the hotel I was caught in a second quake and the Grand Opera House disappeared. I lost interest at this point

However I will mention one thing to annoy even the most patient of players. Given a visible object of a wad of bills and bearing in mind restricted vocabularies I typed *Get wad* with no success followed equally unsuccessfully by *Get bills*. You ve guessed it! *Get wad of bills* was the required input. Hrmmph!

Saigon – The Final Days starts in a Viet Cong prison camp when a mortar blast throws you clear of the hut and you start the long trek home. The game features the worst bit of vocabulary in adventuring

Having rolled a rancid log down the hill to bridge a stream the following commands do NOT get you across *Go stream, Go bridge, Go log, Cross stream, Cross bridge, Cross log, Walk stream, Walk bridge, Walk log*

In fact on returning to this game for this article I could not get across the stream at all. Not that I was really bothered as I only got stuck in the minefield two locations later the last time I played it

Finally Lucifer s Realm a quaint little tale about trying to prove to the devil that Hitler is raising an army to overthrow him. Perhaps I had just had too much when I loaded this one but after meeting Adolf Eichmann and John Wilkes Booth in rapid succession both blocking my way I decided I really didn t care who was the boss in Hades as long as he stopped Jym Pearson from writing adventures

There is another adventure. The Institute from the pen of Mr Pearson. I haven t played it and I don t intend to ■

Glitches of the Month:

It is wholly appropriate that this month's glitch, from R C Bassett of Tilbury, Essex should be from Escape from Traam.

After finding the nylon rope in the wreckage of your spacecraft (all spacecraft carry rope don't they!) you stand at the bottom of a cliff. You'll fall if you try to climb it unaided, but there is a stout bush at the top.

Tie rope to bush **means you can then climb happily to the top of the cliff. But if you can tie the rope to the bush, why bother?**

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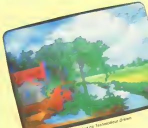
your art's



All these pictures were created using Technicolour Dream

ONE of the reasons for choosing an Atari 8 bit computer is for its superb graphic capabilities when compared to other 8 bit home computers

Among the recent crop of programs that explore the world of Atari graphics are Technicolour Dream from Red Rat Software and Databyte s Graphics Art Department or GAD for short Both programs allow you to paint pictures on the screen with a joystick Technicolour Dream will also accept input from the Atari Touch Tablet

The most impressive feature of Technicolour Dream is its vast range of colours All 256 that make up the Atari palette can be displayed on the screen at the same time There is also a choice of 128 filters which are similar to lens filters on a camera For example if a red filter is used all the colours on the screen are tinged with red

Colours can also be mixed, plotting pixels of one colour next to pixels of another Viewed close up this gives a patterned effect but seen from a distance the colours appear to merge to form a mixed colour

By using filters and colour mixes it is claimed by Red Rat Software that it is possible to create over eight million different shades for your Atari I ve certainly found colours that I never thought possible

An effects option allows you to change colours already on the screen altering such things as overall contrast or individual colour values Pictures can be stored to and loaded from disc Some demonstration pictures are included with the Technicolour Dream package and my review copy came with a disc containing further pictures created using Technicolour Dream most of a high standard

Technicolour Dream pictures have a tapestry look to them due to the fact that pixels are plotted every other row only leaving a thin blank between This is due I suspect to the way that the 256 colours are put on to the screen by a process that merges two graphic mode screens one for luminance, the other for brightness

To assist you when you are drawing there is a line command to plot lines between designated points This is the only drawing command available There are none of the usual options associated with drawing packages such as circle or fill

Technicolour Dream is not very user friendly It took me a while to work out how to use some of the options – particularly in the effects section This is not helped by the manual which says such things as These commands move the 4 bit data 1 bit to the left or right I am told that the manual is due for revision so hopefully some of the commands will be made clearer

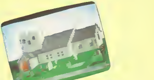
At the time of writing Technicolour Dream is available on disc only at £12 95 but a cassette version at £9 95 will be out soon

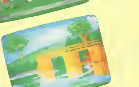
Graphics Art Department is a powerful and versatile graphics package that should provide just about every option the computer artist should ever need

A good test for software of this type is to try it out on someone who is not used to using computers I have been using GAD extensively for the last few days to design graphics for a game Helping me were two artist friends who do not normally have anything to do with computers They

tronic outlet for
tistic expression

STEPHEN WILLIAMSON tries his hand at two painting programs for the Atari





found GAD a joy to work with and did not take long to master the techniques required to use it

GAD has a multitude of commands but has a menu driven control system that makes operation easy My friends especially appreciated the zoom option which allows selected areas to be magnified at one of three levels of magnification to make plotting or erasing individual pixels much easier

Normally four colours are available selected from a 128 colour palette To increase the number of colours display list interrupts can be instigated After selecting an area for the display list interrupt to begin and choosing the new colour then the new shade will appear whenever a pixel is plotted below this point. This is not as versatile as the "256 colours anywhere" method employed in Technicolour Dream but for most practical purposes 128 colours are enough

There are 40 different brushes to choose from ranging from the very large for filling big areas of colour to brushes that draw parallel lines and brushes for dabbing on small solid circles

If the brush selection doesn't suit you an editor facility allows you to design your own Any so designed can be saved to disc and loaded again at a later date

GAD uses a Graphics 7 screen with a definition of 160 × 80 pixels which means that the size of the smallest brush is one pixel A Graphics 7 pixel is more or less square which makes it easier to calculate proportions and angles but does restrict picture definition when compared to say a Graphics 15 picture with its smaller, but thinner pixels

There are commands to help in drawing geometric shapes such as circles triangles and rectangles They can be outlines or solid shapes filled with one colour or a pattern chosen from a pre-set selection The patterns can also be used during the fill command and like the brushes can be edited and re-designed to your own specifications then saved to disc if required

Shapes are drawn using a rubber banding facility which lets you view move or enlarge the shape before pressing the fire button to fix the image on the screen

Areas can be inverted to create a negative image rotated mirrored or moved My friends wanted to plant a forest in front of a mountain scene To do this just one tree needed to be drawn Then using the block move facility the image of the tree was moved to various points on the screen and repeatedly planted to form the forest

Text can be printed on the screen at any point A standard print font is included and an edit mode enables custom designed letters to be produced and saved to disc if required

Pictures can be scrolled in any direction This helps centre a picture on the screen I found it impossible to make a mistake on a picture that cannot be rectified in some manner Undo is a marvellous option that restores a picture to its previous state before the last command This is great for unfilling areas The fill command on some graphic packages can be frustrating If the area to be filled is not completely sealed the fill leaks out with disastrous consequen-

→

ces Undo simply brings you back to the unfilled state before the mistake was made

Pictures can be saved and loaded on disc and hard copy dumped to a printer GAD is set up to be compatible with Epson Gemini and Prowriter printers with the option to customise it to work with other makes I tried to make GAD talk to my Atari 1029 printer but without success Perhaps I entered the wrong printer control code data – or it could be that GAD just will not work with the Atari model

Technicolour Dream's print option is designed to work with an Epson RX80 or compatible model The poor Atari printer gets left out again

Other GAD commands cover brush speed rainbow colour rotation ellipses clear screen jump to a point and kaleidoscope mode There are many more

Both GAD and Technicolour Dream pictures can be incorporated into your own programs The Technicolour Dream manual provides a short Basic routine to load pictures while GAD has a machine code routine that can be copied from the GAD disc as a DOS binary file and then accessed from Basic using a USR command Both methods are straightforward and do not demand complex programming knowledge GAD's machine code routine makes it possible to load GAD pictures to a machine code program without much trouble

The Art Gallery section of GAD enables you to set up your own picture gallery of GAD pictures to show your friends

Graphics Art Department costs £29 90 on disc only This is over twice as much as Technicolour Dream, and at the top end of the Atari software market

If you want to experiment with colour and draw pretty pictures and also have a limited budget Technicolour Dream is fine if you can accept its limitations On the other hand if you want to do some serious graphic work and need a flexible graphics package then fork out the extra and buy GAD, it's well worth the money

In an ideal world I d love to see a graphic package that combines the best of Technicolour Dream and GAD – Technicolour Dream s vast colour palette and smaller pixels but without the inbetween blank lines together with GAD s versatility In the meantime I ll get back to creating my GAD art masterpiece if only it could handle animation as well ■

Program Technicolour Dream
Price £12 95 (disc)
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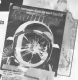

Let Rambas lock out the lock-up

By ROBERT GEAR

MUCH has been said over the past couple of years about the bugs in Atari Basic Revision B. I present here Rambas, a short machine language routine which will cure the most serious flaw – the infamous lock-up which can occur when entering programs

Many remedies have been suggested to alleviate this problem Many are time consuming most are inconvenient and none are the stuff which makes for happy computing

What is required as the definitive solution is a new and bug-free Basic interpreter Short of paying out extra money for Revision C Basic from Atari or Basic XL from OSS the problem would seem to be irresolvable

Not any more! You too can be free of the lock-up problem for good If you have a disc drive you can save the routine as an AUTORUN SYS file and never even see the change Alternatively for cassette users the routine can be modified and saved as a Basic loader program

The Basic interpreter is contained in rom In the XL range this rom covers an area of free random access memory When the computer is first switched on it is normally the Basic rom which is enabled the ram area is merely a shadow and is rarely used

If the Option button is held down during power-up then the operating system will disable the rom and allow access to the ram

A machine language routine can easily move the entire contents of the Basic rom down in memory enable the shadow ram which lies under the Basic interpreter and move Basic back up to occupy its former position Once this has been done it is possible to alter the Basic interpreter and put right some of its faults

It is well known that the lock up problem is caused by a fault in the EXPAND routine which is designed to move the Basic program tables down in memory very quickly This was changed from its Revision A counterpart in a mistaken attempt to put right another bug Actually it was the CONTRACT routine which as at fault That bug was corrected in revision B but EXPAND was fine as it was and should have been left alone

If the disassembly of the Basic rom in an XL machine is compared with the EXPAND routine in The Atari Basic source book from Compute! Books it is easy to see that the EXPAND routine differs significantly by only four bytes If the EXPAND routine is amended to act as it originally did the lock-up problem will be solved

Listing I gives the entire Rambas routine in assembler Included in the listing is code to stop the computer from rebooting every time the Reset button is pressed and thus re enabling the rom-based Basic

When the Atari does a warmstart – that is when the Reset button is pressed – the operating system looks at locations $9 (BOOT?) and $244 (COLDST) COLDST usually reads zero but if the value in COLDST is one then the operating system thinks a powerup is in progress and will reboot the cassette or disc (Incidentally this is a good way of protecting your programs from prying eyes) Rambas sets COLDST to zero to stop the system from rebooting

The operating system looks at the BOOT? register to find out if either the cassette or disc was booted successfully

BOOT? value	*Meaning*
00	No peripherals booted
01	Disc boot successful
02	Cassette boot successful

The operating system's action after Reset depends on which peripherals were booted if any If a cassette boot was successful the operating system will jump to the address held in CASINI (the cassette initialisation vector locations $2 and $3)

If a disc boot was successful the jump will be to the address held in DOSINI (the disc initialisation vector locations $C and $D)

By intercepting the disc initialisation vector and making it point to the RESTART code the ram-based Basic is made permanent even if Reset is pressed The RESTART routine re enables the shadow ram and jumps to where the disc initialisation vector originally pointed in order to pass control back to Basic

Cassette users must fool the operating system into thinking that a peripheral was booted by setting BOOT? to one At the end of the RESTART routine control is passed back to Basic by jumping directly to the Basic warmstart routine

Disc users have two different ways of implementing Rambas

If you have an assembler you can type in the assembly listing from Listing I and assemble the routine into ram Alternatively you can type in and run Listing II which is a Basic loader program containing Rambas as data statements Either way you should go to DOS in order to save the routine as an autorun file

To do this type DOS and use option K (binary save) In response to the prompt give the following save parameters

AUTORUN.SYS,800,878,,600
[Return]

The routine will then be saved as

```
10          *= $0600         ;Locate at page six
20 ;
30 ;  ****************************
40 ;  *  Move Basic down to free  *
50 ;  *    RAM a page at a time   *
60 ;  ****************************
70          LDX #$20         ;32 pages to be moved
80 PAGEDOWN LDY #$00         ;Byte count=0
90 DPNTR1   LDA $A000,Y      ;Move one byte to free RAM
0100 DPNTR2 STA $3000,Y
0110        INY              ;Point to next byte
0120        BNE DPNTR1       ;If page not done, go back for next byte
0130        INC DPNTR1+2     ;Increment the page pointers
0140        INC DPNTR2+2     ;to point to next page
0150        DEX              ;Decrement page count
0160        BNE PAGEDOWN     ;Branch to move next page until all done
0170 ;
0180 ;****************************
0190 ;*  Enable the shadow RAM   *
0200 ;****************************
0210        LDA $D301
0220        ORA #$02         ;Set bit 1 of memory control register
0230        STA $D301
0240 ;
0250 ;****************************
0260 ;* Move Basic back up to it s *
0270 ;*   original position      *
0280 ;****************************
0290        LDX #$20         ;32 pages to move
0300 PAGEUP LDY #$00         ;Byte count=0
0310 UPNTR1 LDA $3000,Y      ;Move one byte back up from free RAM
0320 UPNTR2 STA $A000,Y
0330        INY              ;Point to next byte
0340        BNE UPNTR1       ;If page not done go back for next byte
0350        INC UPNTR1+2     ;Increment the page pointers
0360        INC UPNTR2+2     ;to point to next page
0370        DEX              ;Decrement page count
0380        BNE PAGEUP       ;Branch to move next page until all done
0390 ;
0400 ;****************************
0410 ;* Amend BASIC Expand routine *
0420 ;****************************
0430        LDA #$F0
0440        STA $A80F
0450        LDA #$12
0460        STA $A8EB
0470        LDA #$EA
0480        STA $A8E1
0490        STA $A8E2
0500 ;
0510 ;****************************
0520 ;*  Revector DOSINI to make *
0530 ;*    the RAM based Basic   *
0540 ;*       reset-proof        *
0550 ;****************************
0560 ;
0570 ;****************************
0580 ;*    Lines 610-640 for     *
0590 ;*      DOS users only      *
0600 ;****************************
0610        LDA $0C          ;Set restart address of RAM Basic
0620        STA RAMBASIC+1   ;to point to DOS initialisation routine
0630        LDA $0D
0640        STA RAMBASIC+2
0650 ;****************************
0660 ;****************************
0670        LDA #RESTART&255 ;Set DOS initialisation vector
0680        STA $0C          ;to point to RAM basic restart
0690        LDA #RESTART/256
0700        STA $0D
0710        LDA #$00         ;Set COLDST
0720        STA $0244
0730        LDA #$01         ;and BOOT? to prevent reboot every
0740        STA $09          ;time the RESET button is pressed
0750 ;
0760 ;****************************
0770 ;***  RESTART BASIC      ***
0780 ;****************************
0790        JMP $A000        ;Do Basic coldstart
0800 ;
0810 ;****************************
0820 ;* Re-enable the RAM resident *
0830 ;*     Basic after RESET    *
0840 ;****************************
0850 ;
0860 RESTART  LDA $D301      ;Re-enable the shadow RAM
0870        ORA #$02         ;by setting bit 1
0880        STA $D301
0890        LDA #$00         ;Amend COLDST
0900        STA $0244
0910        LDA #$01         ;Amend BOOT?
0920        STA $09
0930 RAMBASIC JMP $A000      ;Default Restart address for
0940 ;                        Basic (restart address will
0950 ;                        be altered automatically
0960 ;                        for DOS users).
0970        .END
```

Listing I

an autorun file and the start address will be specified as $0600.

Whenever you boot the disc with this file present the transfer routine will be automatically loaded and run and the amendment to Basic will be quite invisible to the user.

The Rambas transfer routine can be made to work on cassette-based systems with only a small modification.

If you are a cassette user type in the Basic loader in Listing II with line 10100 modified as directed in the listing. Don't forget to save the program to cassette using CSAVE *before* you test it. An error in the data will probably cause the machine to freeze and you will have to switch off and power up again to regain control.

The program should be loaded using CLOAD and run immediately after power-up. There will be a short pause and the familiar READY message will appear.

Since Basic has been restarted with a coldstart all traces of the loader program will be gone and it will be unnecessary to give the NEW command to clear the memory before proceeding. You should now have no more problems with lock-ups.

Correcting bugs is not the only use for a ram-based Basic such as I have described. If you study the Basic disassembly you will probably see many ways in which Basic can be

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altered or improved I hope these suggestions will give the interested reader some food for thought

- Altering the error handling routines to give meaningful error messages instead of error numbers
- Rewriting the program editor to give greater freedom of movement around the stored program
- Adding extra commands to the interpreter for example commands for handling player/missile graphics ■

```
10 REM ADMOS, By Robert H. Gear
20 REM ATARI USER, JULY 1988
30 REM
40 REM ******************************
       *                            *
50 REM * CASSETTE USERS,  PLEASE    *
       * TYPE LINE 10100 AS FOLLOWS *
       *                            *
60 REM * 10100 DATA 234,234,234,    *
       *          234,234,234,234,  *
       *          234,234,234       *
70 REM *                            *
       ******************************
90 REM
100 RESTORE
110 ADDRESS=1536
120 READ DATA
130 IF DATA=-1 THEN A=USR(1536)
140 POKE ADDRESS,DATA
150 ADDRESS=ADDRESS+1
160 GOTO 120
10010 DATA 162,22,160,0,169,0,160,153
10020 DATA 0,36,200,208,247,238,6,6
10030 DATA 238,3,0,202,208,236,173,1
10040 DATA 211,3,2,141,1,211,162,32
10050 DATA 160,0,185,0,88,153,0,160
10060 DATA 200,208,247,238,36,6,238,39
10070 DATA 6,202,208,238,189,240,141,2
22
10080 DATA 160,163,10,141,226,160,169,
234
10090 DATA 141,225,160,141,228,160
10100 DATA 185,12,141,110,6,165,12,141
,159,6
10110 DATA 169,100,133,12,169,0,133,13
10120 DATA 169,0,141,60,2,169,1,133
10130 DATA 2,76,0,160,173,1,211,5
10140 DATA 2,161,1,211,169,0,141,00
10150 DATA 2,169,1,133,2,76,77,160
10160 DATA -1
```

Listing II

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	6920	20	5041	30	471
40	8773	50	16155	80	12066
70	8263	90	871	100	1733
110	2330	120	2027	130	4067
140	3550	150	3550	160	3614
10010	4709	10020	4707	10030	4750
10040	4889	10050	4710	10060	5027
10070	5461	10080	5520	10090	4495
10100	8939	10110	5000	10120	1741
10130	4135	10140	4867	10150	6400
10160	1293				

Tired of typing?

Take advantage of our finger-saving offer on Page 69

MicroLink

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What it offers the Atari user . . .

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The majority of MicroLink subscribers can connect to our mainframe computer in London by making a local phone call. This is possible because they use British Telecom's PSS system, which has access points all over Britain. A local phone call is all you need, too, for direct access via MicroLink to all the other countries belonging to the international Dialcom system.

Telemessages – at a third off

The modern equivalent of the telegram is the telemessage. Send it before 10pm and delivery is guaranteed by first post the following day (except Sunday). The service was intended for people phoning their message to the operator, which costs £3.50 for 50 words. But you can now use it via MicroLink, for only £1.25 for up to 350 words! For an extra 65p your message can be delivered in an attractive greetings card.

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With MicroLink you can turn your micro into a telex machine and can send and receive telex messages of any length. You will be able to communicate directly to 96,000 telex subscribers in the UK, 1½ million worldwide – and even with ships at sea via the telex satellite network. Business people can now send and receive telexes after office hours, from home or when travelling.

What does it all cost?

Considering all the services you have on tap MicroLink is remarkably inexpensive. You pay a once only registration fee of £5, and then a standing charge of just £3 a month. On-line costs are 3.5p a minute (between 7pm and 8am) or 11p a minute during office hours. There is an additional 2.5p a minute PSS charge if you are calling from outside the 01 London call area. Charges for telex, telemessages and storage of files are given on the next page.

How much it costs to use MicroLink

Initial registration fee: £5

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Connect charge: 3.5p per minute or part – cheap rate; 11p per minute or part – standard rate.
Applicable for duration of connection to the Service. Minimum charge 1 minute.
Cheap rate is from 7pm to 8am, Monday to Friday, all day Saturday and Sunday and public holidays. Standard rate is from 8am to 7pm, Monday to Friday excluding public holidays.

Filing charge: 20p per unit of 2,048 characters per month.
Applicable for storage of information such as telex, short codes and mail files. The number of units used is on average calculated by reference to a daily sample.

Information Databases: Various charges.
Any charges that may be applicable are shown to you before you obtain access to the database.

MicroLink PSS service: 2.5p per minute or part (300 baud). 3p per minute or part (1200/75 baud).
Only applies to users outside the 01 London call area.

Telex registration: £10

Outgoing telex: 5.5p per 100 characters (UK). 11p per 100 (Europe). 18p per 100 (N America). £1.25 per 400 (Rest of world). £2.75 per 400 (Ships at sea).
Deferred messages sent on the night service are subject to a 10 per cent discount.

Incoming telex: 50p for each correctly addressed telex delivered to your mailbox. Obtaining a mailbox reference from the sender incurs a further charge of 50p.
It is not possible to deliver a telex without a mailbox reference. If a telex is received without a mailbox reference the sender will be advised of non-delivery and asked to provide a mailbox address.
Each user validated for telex and using the facility will incur a charge of 6 storage units a month. Further storage charges could be incurred depending on the amount of telex storage and the use made of short code and message file facilities.

Telemessages: £1.25 for up to 350 words.
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Radiopaging: No charge.
If you have a BT Radiopager you can be paged automatically whenever a message is waiting in your mailbox.

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Billing and Payment: All charges quoted are exclusive of VAT. Currently all bills are rendered monthly.

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MicroLink is setting up a central store of software programs which you'll be able to download directly into your micro. The range will include games, utilities, educational and business programs, and will cover all the most popular makes of micros.

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What you need to access MicroLink

You must have three things in order to use MicroLink: a computer (it can be any make of micro, hand held device or even an electronic typewriter provided it has communications facilities), a modem (it can be a simple Prestel type using 1200/75 baud, or a more sophisticated one operating at 300/300 or 1200/1200 baud) and appropriate communications software.

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CHECK YOUR MICRO – REV C IS AROUND

WITH reference to M.A. Philip's letter in the April issue of Atari User I can confirm that 800XLs with Rev C Basic in them are available in the UK – I have one.

I bought a Disk Drive 800XL package in Dixons recently and was having problems with the keyboard locking up after a lot of typing.

I wrongly assumed this was my fault until I read about the bugs in your March issue. I peeked location 43234 and found I had Rev B Basic.

However what really annoyed me was that a colleague at work had bought a similar package a few days later at a lower price and got Rev C Basic.

I returned my package to Dixons and after showing the manager the magazine article got a full refund. I subsequently got a new package from Currys with Rev C Basic.

The moral is before buying an 800XL package check that you get 234 and not 96 – **Gareth Foster, Whitton, Middlesex.**

Mine's a 234 too!

WITH reference to your comment after M.A. Philips letter in the April Mailbag I have a bundled 800XL Pack and on reading about the bug at 43234 I checked the address to find the contents were given as 234 – **M. Smith, Dartford, Kent**

● Thanks for letting us know. If you have recently got an 800XL and you don't get an answer of 234 if you PRINT PEEK(43234) then you probably have an older machine.

Take it back to your dealer and ask him to provide you with the up-to-date version as the Revision B machines have some bugs in them.

Our thanks to everyone who wrote in to us telling us about their own Revision C 800XLs including James Kelly, Mr A. Boardman, Ejber Ozkan, Mrs S. Woodward, P. Stallard, Alan Norman, T.H. Ralphs, David Freath, Julian Madison, P. Abbot and many others too numerous to mention. You can stop writing now please.

Screwdriver solution

REGARDING F. Ward's letter about the £20 play button on the 1010 recorder I have had this happen twice, the first time just five days after the guarantee ran out.

I duly took my recorder along to Silica Shop who quoted, yes you guessed it, £20 for the replacement. Having no alternative I handed over my crisp £20 note and my 1010 became operable once more.

After about another 12 months it happened again this time before parting with the readies I questioned one of the salesmen. After torture he broke down and confessed that it was possible to fix the recorder by myself.

So having gained some electronics experience I decided to have a go. I went back to questioning the salesman who by now was a quivering wreck.

I asked the price of a new button, half expecting the price to be in double figures, but was flabbergasted when he told me £1.12. After picking my chin up off the floor I found out how it was fitted.

Firstly unscrew the four base screws and separate the top from the bottom. Then locate the buttons inside – not hard. Remove the locking circlip on the rod around which the buttons pivot, then push the rod through the bracket and pull out the rod and buttons.

Slide off the buttons and replace the broken key with your new one. Replace rod into the chassis, replace the locking circlip and finally place the two halves together and do up the four screws.

Easy – honest. It took me about a quarter of an hour.

I don't recommend this to be done when the recorder is still under guarantee but for those people handy with a screwdriver whose units have expired it's a great money saver.

Silica have admitted these buttons are notoriously weak. So come on Atari, £20 for a lump of plastic is just not on!

I hope my letter helps people and saves them a lot of unnecessary expenditure – **Ian Sibthorpe, Bexley Heath, Kent**

Key pinned

IN the March issue I was surprised to read about the £20 button by F. Ward.

The same thing happened to me when I pressed the Play key on my recorder – it just snapped. I opened my recorder up to see what damage I had done, only to see the key in two halves.

I thought on it for a while and decided to replace the broken Play key with the Pause key.

This was not too difficult, just a matter of removing the metal cassette mechanism from the top half of the unit and removing a small circlip washer from the key rail.

It was then simple to switch the key positions and thus give me time to think of some way to mend the broken key. I tried glue but after setting for two days the key fell apart under use.

I then thought of drilling a small hole – using the smallest drill I could find – up the centre of the two halves and pushing a panel pin into them. I put a spot of glue on them before bringing the two bits togther just to make sure.

The result was a stronger key that before, and a simple wire nail saved me up to £20 into the bargin – **Barry Nelson, Lisburn, County Antrim**

● Two good ideas, but don't forget that doing these repairs yourself will void the manufacturers guarantee. So if it is within 12 months of purchase take it back to your dealer.

Graphics artists

THANKS for printing three of my screens in the article on ST graphics in your May issue.

The quality of the screen shots was quite good but I was a little disappointed to see that there was no credit for us hard working artists!

I have often admired published graphics in Atari User only to be left wondering who they were – **Mo Warden, Bloxwich, Walsall**

● Ah yes ... sorry about that Mo. We did mean to credit you – honest.

To set the record straight the Degas and NeoChrome pictures used in the May issue were by Kev Bulmer himself – bottom four pictures on pages 10 and 11. Mo Warden – third picture on page 11 and both pictures on page 13. J. Powell – Thumper Page 12 and Tom Hudson – M-TV robots Page 12.

In the June issue the pictures on pages 12 and 13 were by Tom Hudson with the exception of the Computer Aided Documentation which was by Kev Bulmer. The ST cover showed some of the stages involved in creating Kev's Android masterpiece.

If anyone has come up with

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ATARI USER Mailbag

WE welcome letters from readers – about your experiences using the Atari micros about tips you would like to pass on to other users and about what you would like to see in future issues

The address to write to is

Mailbag Editor
Atari User
Europa House
68 Chester Road
Hazel Grove
Stockport SK7 5NY

other graphic wonders on their ST or 8-bit drop us a disc of them and we may publish a few in a future issue

Graphics modes

I HAVE just got an 800XL and find some of the Basic easy to understand but I do not understand the graphics at all

On our school computers all you have to do is use the word GRAPH but on the Atari you use GRAPHICS followed by a number

I do not understand this Every time I attempt graphics I get an error message I feel this is a vital part of programming so could you please help me – **Martin Harris, Hertfordshire.**

● The reason that the Atari requires a number after GRAPHICS is to tell it which graphics mode to use – there are 15 basic modes plus some others

Atari graphics are much more powerful than those on most computers and there's not enough space in an entire issue to cover them in full

We did run a complete series on using graphics in our first eight issues – May to December 1985 – which should answer all of your immediate questions

Looking for Yohan

I AM writing to you about Bounty Bob After getting through Bob's calisthenics his playroom Yukon's Revenge, even Acid Rain where is Yukon Yohan?

After completing the final level there was still no sign of him We changed him from a smoker to a gum chewer and did it again still no sign

The game in every respect is brilliant probably the best I have ever played on my 800XL or anywhere else

Finally if you know of an Atari user group in the Birmingham area we would be grateful – **Robert and Karen Eventine, Birmingham.**

● Sorry cannot help you with Yukon Yohan Perhaps a reader can oblige

The Birmingham Atari User Group meets on the first third and fourth Thursday of each month at the Royal George opposite St Martin's Church, Bull Ring Birmingham

Bugs detected

HERE are some bugs I have found in a couple of games In Tapper when you have lost your last life press the fire button three or four times to continue at the same level and score After you lose this life you will receive eight more

Castle Wolfenstein when you have lost a life – not been blown up – press the one key twice as the game screen turns blue and the drive is running Try this and see what happens – the result is very useful – **Brian DaBinett, Brockley**

Where did the colour go?

I HAVE just got an Atari 130XE with a 1010 program recorder

I was very pleased with the computer until I tried it on a colour TV I loaded a cassette game into the computer but could not get any colour on the screen

I wondered whether it was just the game at first, so I tried the Basic colour command but still got none

Should I get my computer repaired, or is this a problem I could solve myself? – **Jason Dyke, Gravesend, Kent**

● If you can't solve the fault by returning your TV set and adjusting the colour controls your best bet would be to take the computer back to your dealer and get it replaced There is nothing you can easily do yourself

Spelling mistake

WHENEVER I type a setcolour command, such as SETCOLOUR 2 0 0 I get this

```
ERROR-   SETCOLORR █,0,0
```

Please can you sort out this problem

Also whenever I load some games with Start and Option I sometimes get a BOOT ERROR BOOT ERROR message and then the computer puts itself into SELF-TEST mode What's happening? – **Mark Keys, Sherwood, Nottingham.**

● You haven't looked carefully at your manuals have you? The command is spelt SETCOLOR not SETCOLOUR If you type it correctly it will work OK

As to your BOOT ERROR problems it sounds as though you might need to clean the heads on the tape recorder

All Boot Error means is that the tape has failed to load If it happens on too many of your tapes consider taking the recorder back to be checked

Speedy listings

I HOPE this will help Peregrine Hill, Mailbag May 1986 regarding the speed listings scroll

Listings do scroll too fast to read but there is a way of pausing the listing without recourse to repeated use of Break LIST (line no) (line no)

This is done by holding down the Control key, then pressing the 1 Key This will pause the listing Pressing Control 1 again will continue the scroll

Using Control 1 will freeze the computer and it will not accept any entry from the keyboard, except Control-1 or Break So if you use this remember to press Control 1 to continue the scroll or Break to edit your program

This feature can also be used to pause Basic programs while they are running but remember to hit Control 1 again to enable the program to continue – **Peter Boulter, Twickenham, Middlesex**

Sluggish interpreter

AS a confirmed Basic user I am rather disappointed with the language provided with my recently bought 800XL.

While its features are entirely adequate its speed is prohibitive for the large data handling programs which I write

I have used a BBC computer which offers equal if not more facilities and yet seems much faster

This may be a naive comment, but since both these machines use the same processor surely a faster Basic for the Atari could be written

I have been following the

recent articles in Atari User on the Basic Compiler with some interest and while this offers probably the best solution to the speed problem, I feel that there is still room for a fast translator type Basic

Your comments on this subject would be appreciated **Mike Ross, Didcot, Oxon**

● There are indeed faster Basic interpreters for the Atari the best of which is probably O S S s Basic XE

It is entirely compatible with your standard Atari Basic programs but runs between two and four times faster has full procedure operations with parameter passing player/missile graphics I/O control DOS functions and IF THEN ELSE ENDIF WHILE WEND string arrays – plus LEFT$ MID$ FIND and so on

It also features fast array sort functions and much faster floating point operations All of this is packed into a bank switching cartridge which takes up no more memory than standard Basic does

To cap it all If you happen to have a 130XE with 128k you can use that extra 64k bank for programs completely automatically which means more free memory than any other Basic

O S S products are imported from US by Software Express and are thus a little expensive but once you ve used them you ll never turn back

Getting it wrong

I OWN a 130XE disc drive 1050 and XC II cassette deck I have bought your magazine since January 1986 and am having some difficulty typing in the listings

Could you print the listing of the Get It Right! program again so I can see where I ve been going wrong with Des Bells and Dots Square – **J.A. Buys, Holland**

* * *

I HAVE just read David Chapman s letter in your May issue I also am a newcomer to home computing, and would like to know how to use the checklist

As you did not reply to this question from him would you reply to mine?

By the way, a really good book explaining programming is Easy Programming for the Atari Micros by Eric Deeson

It is written in easily understood language which even I could get to grips with – **Diane Bonnington, Stratford, London**

* * *

I TRIED your checksum in the March 1986 issue of Atari User on a program called Bounce from the February 1986 issue

When I typed the program in I then typed LIST C and pressed return then the computer started saving

When it finished it said "Delete program by typing NEW which I did It then said Now load get it right into the machine taking note of instructions contained in REM 999 so all I did was type CLOAD and after a few seconds I got Error 21 load file error

Please, tell me what I m doing wrong and what is REM 999 – **Christopher McInerney, Dunstable, Beds**

* * *

I HAVE recently got an Atari 800XL computer and since then have been buying your useful and informative magazine However I have noticed that your listings have a section labelled Get It Right!

I get the feeling that this will be useful when inputting your programs but I do not know how to use it

Could you please explain to me how to use this facility as I invariably make mistakes in my typing – **Dave Smallman, Peterborough**

● To use the Get It Right! program firstly make sure that you have the updated version of the program as provided on the January 1986 disc/cassette

After typing it in CSAVE it to a spare cassette or just save it to disc and write protect it

Line 999 will need to be altered depending on whether you have a disc or cassette

Each time you want to checksum a new program type it in from the magazine and then list it to tape or disc – for example LIST "C" or LIST "D TEST

Now type NEW and load the Get It Right! tape back into memory with CLOAD

Put your listed program back into your recorder/disc drive and type RUN

The checksum information will now magically appear on the screen Check this off against the version printed in the magazine If you have made any mistakes the numbers will not tally on the incorrect lines

If you want to reload the listed program again type NEW and then use ENTER "C" or ENTER "D TEST

In response to numerous requests we shall be reprinting the Get It Right! program in next month s *Atari User*

Correction corrected

FOR those of you with XL or XE machines who have been trying to use Frank O Dwyers Basic Compiler program we re sorry to say there was a small mistake in last month s correction piece on page 32 (How embarrassing)

All you need to do to get it fully working (honest) is to ENTER the Library section into your Assembler/Editor, and add the following two lines

```
585     JMP CONTPROG  ; BYPASS XL/XE 'SOUTCH' & 'GET' MODS
530 CONTPROG
```

Then LIST it back on to your master tape or disc Otherwise your compiled program will more than likely just print a heart on the screen and promptly crash When you ve written some programs using the compiler why not send some examples in to us? We ll print some of the best in a future issue

Overlapped listings

I HAVE an Atari 800XL, and am having difficulty typing in certain lines of your published programs

When I type them in the 800XL rejects them I have also tried on two other 800XLs with the same result

Some examples are October 1985 Pontoon lines 900 and 1110 January 1986 Des Bells line 4010 and March 1986 Horseplay lines 1010 and 2670

Is this because the games have been typed on a different model?

I have tried altering the lines and splitting them up but with my very limited knowledge of Basic I am having little success Any light thrown on this subject would be very welcome – **William Jackson, Buckhaven, Leven Fyfe**

* * *

I HAVE an Atari 800XL and have been trying to type in Mr Humpy but the last bit of line 4010 won t go in – 8 BRIDGE 15 ? 6,"

Can you tell me if there is any way to get the line in? – **Bryan Vince, Luton Beds**

● YOUR problem lies in the fact that the Atari can only accept up to three screen lines of typing at once – that s what the bell near the end of the third line means

Some of our listings as you have found out overlap on to FOUR lines. So how do you type them in?

Firstly, before starting to type a program in try typing POKE 82 0 This allows you to use the space in the left margin to type in giving you an extra six characters

The other way to pack more on to a line is to use

→

abbreviations. For example typing POS 12 12 means the same to the computer as POSITION 12 12

The abbreviations are listed in the manual but POS for POSITION SE for SETCOLOR and DR for DRAWTO are some common ones

Also don't type in spaces outside of double-quotes when you're short of space

```
10?"HELLO":GOTO1000
```

is just as good as

```
10 ? "HELLO" : GOTO 1000
```

to the computer

Using a combination of these tricks you can type in anything that appears in these pages – don't forget someone had to type it all in in the first place

Graphic characters

I AM having difficulty programming Fruit Gambler from your August 1985 issue

In this month's issue a correspondent has explained how to get the arrow symbol but I cannot key most of the graphic characters printed in this program

Could you tell me how to type these characters in? The lines that are causing me difficulty are 1150 1160, 1170 1710 1736, 1740 1750 1760 and 1770 – **V Dryden, East Sussex**

● The characters you refer to are all created by pressing keys while holding down the Control button

These are listed in full in our December 1985 issue along with all of the arrows and so on that you mention

Listings often contain these characters side by-side to make block shapes and under lines

Contacts wanted

AT the end of last year I decided to sell my BBC Micro after four years of total boredom

With part of the money I bought an Atari 800XL and 1050 Disc Drive Now I look on computers as a joyful hobby once more

I am interested in contacting Atari users in the Colchester district so I can exchange views software and so on **Mark Gosling, 9 Norfolk Avenue, Mersea Island, Essex CO5 8EN**

* * *

I LIVE in Shepton Mallet, Somerset and own an 800XL. Could you put me in touch with any other Atari users nearby? – **David Stevens, Fox Hollow, 8 Gold Hill, Shepton Mallet, Somerset, England**

* * *

PENPALS are required in the Merseyside area to swap hints and tips on programming and games I own an 800 and 130XE, and am shortly buying an ST

Please write to **Mike Lynch, 24 Oakdene Road, Anfield, Liverpool, Merseyside L4 2SR**

* * *

I WOULD be interested in getting in touch with anyone who is interested in serious, programming on the 800XL I would like to swap ideas on assemblers, monitors and so on **Nino Matassa, 66/67 Talbot Street, Dublin 1, Ireland**

* * *

I OWN an Atari 800XL, and here in Malaysia Atari computers are not as popular as in the USA and the UK

Most of the people here just think of it as a games machine so I have many problems in getting the software and hardware

The nearest place where I can get Atari User is 100 miles away I can't get every issue of the magazine and the ones I can get are two months late

I would like some pen pals who own Atari 8 bit computers in any country outside Malaysia Interested please contact **Ooi Chee Kian, 192 Taman Lam Sun, 05200 Alor Setar, Kedah, Malaysia**

* * *

I OWN an Atari 800XL and XC11 data recorder and would like to correspond with Atari users of any nationality interested in assembler machine code and so on **Luis Alberto, Rua Miguel Pais No 27 30B, 2830 Barreiro, Portugal**

● If you find yourself out in the cold when it comes to finding other Atari enthusiasts you could always join MicroLink

There are thousands of users of computers including Ataris from all over the world

A good advert for Atari

I RANG the Atari help-line to ask for details of a local 520ST supplier

They gave me the details of an area wholesaler who gave me the name of a company in Worcester from whom I bought the 520ST a 1Mb disc drive and an Epson LX 80 printer

I received no demo nor assistance with setting up, and received only the systems disc – no other free issue software

The disc drive never did work and was replaced and by going direct to the wholesaler I was able to get the other free issue software

From time to time I asked for the new free issue software which I read about in your magazine, but to no avail My dealer just told me that the new was not as good as the old and that was that

In February I read an advertisement by Software Express in your magazine and bought some business software from them

They showed great knowledge and skill and were obvious enthusiasts I used the software but experienced odd troubles with it, concluding that it was my lack of computer literacy

The whole system then gave up quite recently and it was thought to be the disc drive again This was returned to the dealer who told me it had a 90 day warranty but that they would send it for repair

As I have a business to run and could not afford to wait the 7 to 10 days needed for repair I decided to buy another disc drive, so that eventually I would have twin disc drives At the same time I wanted to have ROM chips fitted to my board

Naturally I returned to Software Express who found to their surprise that the board was one of the first ever made and in theory at least could not have been sold in December 1985 in consequence they could not fit the chips

Although they were not the original dealer they arranged for a wholesaler to replace the board with a new one, to which they fitted the ROM chips In the short time since I bought the Atari I have learnt the following lessons – firstly Atari do not deal with correspondence Also if you are a business user and require support go to a dealer like Software Express My first choice turned out to be a computer game retailer

The quality control on Atari products is obviously not all it should be so check the warranty terms carefully In my case I later learned that the warranty on the disc drive is 12 months not 90 days.

Finally read Atari User carefully, and get the updated software and other equipment upgrades to which you are entitled

I cannot praise Software Express enough for their service and efficiency – they are a better advertisement for Atari products than Atari deserve – **M C. Felers, Lower Broadheath, Worcester.**

on the service and you can send electronic mail or chat to them directly via your keyboard and screen.

Don't forget that you can do all of this with a local phone call even if the other user is the other side of the world. It beats having to rely on Snail-Mail anyway.

Joystick ports

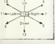
PLEASE could you tell me how to use both joystick ports within a Basic program?

I suspect it will need a machine code routine accessed by the Basic program, or can I peek into specific memory locations to get the same results? – **L. Graves, Swindon, Wiltshire**

● Although you can use peeks and machine code why not use the STICK command to read the joystick?

All you need to do is use LET A=STICK(0) or LET A=STICK(1) depending on which joystick you are interested in.

The variable A, or whichever one you used, will then contain one value from the following:



The trigger button can be checked by using STRIG(0) or STRIG(1). If the answer is 0 the button is pressed.

Printer software

I HAVE recently bought a 1027 printer to use with an 800XL with cassette recorder.

However I have been unable to obtain software – cartridge or cassette – to put the printer to good use – the only word processor type software being on disc.

Could you tell me of anything available? – **B. Middle, Penygraig, Tonypandy**

● The best answer to your problem is, as you say, disc-based word processors such as SuperScript or PaperClip.

However Atari's own AtariWriter cartridge is quite a nice little word processor for the money, and it will work with cassette.

Your only problem may be that of finding a copy, as they are a little scarce these days.

Print quality

A DISABLED friend of mine was given an Atari 800XL plus data recorder and a bundle of games for Christmas. She is now very keen to make up a word processor.

What she wants to do is to type words in upper and lower case that appear on the screen so that she can modify and then print them on an A4 sheet in good typescript – so maybe a full word processor is not needed.

With frantically scraped together money I bought an Atari 1027 printer knowing that other stuff would probably be needed.

She was pleased knowing my technical aptitude that I had not returned hearing a 1928 Remington typewriter and a PP8 battery but when I tried out the printer we were both disappointed for two reasons.

The typscript wasn't black enough – despite changing that little roller and even rolling the spare one across the letter die. It's irritatingly mild looking.

Also there are two lines on the TV screen = (approx) one line on the A4 sheet. This will surely dash to pieces the dream of viewing a complete A4 sheet on the screen and then selectively altering same.

Bit of a depressing situation. Perhaps I should have bought an electric typewriter with computer compatibility.

I know that I've got to buy a program but do I have to discard the data recorder and get a disc drive? – **J. Chapman, Birmingham**

● There is little that can be done to improve the print quality. Don't forget that although it set you back quite a sum of money the 1027 is still a budget type of printer when compared to most letter quality machines.

The screen problem can't be overcome completely other than with a hardware modification, but you could use a word processor such as SuperScript, AtariWriter Plus or PaperClip, all of which give you preview mode which allows you to use the 40 column screen as a window on to a larger format.

This allows you to check that the columns are aligned correctly and so on before you commit the text to paper.

As to your question on cassettes – we would strongly recommend that you invest in a disc drive – all of the above programs being disc only – both for greater reliability and much greater speed.

Reversing the screen

I TYPED into my 800XL the Micropainter transfer program from February's issue of Atari User. It is very useful but I have a few queries.

The program also works for Koala Pad which uses 62 sector graphic files. However some files appear reversed when dumped to a printer, in other words as negatives.

Is there any quick way to reverse the screen before the GR 8 screen dump? I can do it only by changing or reversing each pixel on the screen. It takes ages but it works.

Secondly, when a screen is saved it requires 64 sectors instead of 62. This doesn't seem to make any difference when loaded back on the screen, but when the saved screen is dumped to a printer the last pass of the printer leaves two lines of garbage at the end. – **R.G. Routledge, Westcliff-on-Sea, Essex**

● The real answer to your problem is to use a machine code program, but the fastest that poor old Basic will do is by using the following program:

```
10 ADDR=PEEK(88)+PEEK(89)*256
20 FOR I=ADDR TO ADDR+7679
30 POKE I,PEEK(I)-255
40 NEXT I
```

This should be run with the graphics screen displayed but before going to the dump routine. It will invert the whole of the screen – faster than LOCATE and PLOT, but still not very fast I'm afraid.

Surviving Mercenary

I WOULD like to compliment Novagen on its new game Mercenary. I have just spent two days playing it, and have just finished it the easy way.

For anyone who is stuck in Mercenary I suggest you take the easy way out and send away for the survival kit and hint sheet.

This is a good way to get you to spend more money but for around £3 it's well worth getting.

It is also a good idea to save your position at frequent intervals to save time if you lose the program. One last hint: don't go into the prison! – **W. Wedderburn, By Aviemore, Scotland**

Advertising begins at home

I HAVE just read your comments on Micro Live in Atari ST User and I would like to say I and my friends wholeheartedly agree with what you say.

Micro Live has always been an advert for Acorn micros

→

Ever since the first programme the BBC Micro has been projected as being vastly superior to anything else

In an early programme there was a comparison between word processors for home micros. This was done with five or six different micros lined up, each using its own program

Atariwriter was featured on an 800XL, operated by some TV personality. Needless to say Atariwriter was found to be difficult to use because it only had a 40 column display and was generally looked down upon

The Beeb of course was the machine for word processing with Wordwise. When Micro Live's American correspondent announced the launch of and impact of the 520ST it was played down at this end and the report seemed to be cut short.

Be fair though its not only Micro Live. Tomorrow's World and Blue Peter are also involved in this massive hype

Without this advertising support the BBC Micro may well have died from an excess of overcharging a long while ago – **David Butters, Swaffham**

Bugs, bugs and even more bugs

SEVERAL years ago when the BBC Micro was first announced there were many tales of bugs in ROMs, dodgy PSUs and flaky ULAs. It seems that even now a machine is plagued with problems from the point of purchase

I bought an Atari 520ST in October 1985 and have since had no end of trouble in trying to obtain the specification as advertised

The operating system in ram is still not available as an upgrade in rom, so you effectively lose 200k of memory from the point go

With Basic loaded you are left a meagre 5k of program space. I am now told by Atari that if I wish to connect a colour monitor to my machine after the rom upgrade which costs £25 I will be required to buy a new video chip for £40

It also seems that to get a decent version of Basic. In other words without bugs Atari users are going to have to fork out £90 for the new Atari Basic

This is just typical of the computer industry. When will manufacturers finish their products before releasing them? – **David Hale, Ashford, Middlesex.**

Less costly control box

I HAVE had an Atari 130XE for about a year and would like to know if it is possible to control several motors

All I want is the control box. I have seen the zero 2 robot for £119.95 but this is too expensive for me, so can you tell me where I can get a less costly control box.

I have tried Silica Shop but they don't do robotics for the Atari – **Philip Mack, London SE5 4DY**

● In the new Great Little Gadgets series we will be covering motor control and so on

The black line way to more legible screens

By
LEN GOLDING

RUMOUR has it that a certain competitor of the Atari can display listings with black ruled lines under every line of text. This probably doesn't make much difference in normal usage, though it's an interesting effect.

However when you are editing crowded programs or displaying text for very young readers the lines can improve screen legibility so here's a routine that will put the competition to shame

It works by changing the display list naturally enough but it has to cheat a bit because there's a potential conflict between the Antic chip and the screen editor

The editor assumes there are always 24 text lines in a Graphics 0 screen and it won't notice the thin black ones But Antic controls the TV display and it wants to add extra lines which means your TV display will get taller

Twenty three black lines are needed and each is one eighth of a Graphics 0 line high So we need to accommodate the equivalent of three extra text lines on screen

Fortunately Atari left very generous top and bottom margins when they designed the hardware so most TVs can cope provided they are adjusted correctly

The new display list sits in page 6 – where else? – and the data statements show what it looks like Every 0 produces a blank line and every 2 a normal text line

The first three numbers added together determine the top margin and you will probably need to experiment with other values to suit your own TV

Legal numbers are 0 16 32 48 64 80 96 and 112 Don't forget that this is bending the rules, as all display lists should according to Atari start with three 112s

A display list is not a true machine code routine although it looks a bit like one It's more of a data table which Antic refers to as it draws the TV display

You can therefore change some of the numbers without locking everything up – though you will get some peculiar results if you alter any but the first three

Lines 10 to 30 copy the new display list into page 6, starting at address 1536 Line 40 tells this display list where the screen is located in memory and line 50 gives Antic the new address to tell it to start using the new display instead of the standard one

Once this has happened the Basic loader routine is no longer needed Type NEW and the new display will still remain

Pressing System Reset will bring back the conventional screen but the ruled lines can be restored by repeating the POKE instructions at line 40 ■

```
10 FOR X=0 TO 54:READ D:POKE 1536+X,D:
NEXT X
20 DATA 16,16,80,66,255,255,0,2,0,2,0,
2,0,2,0,2,0,2,0,2,0,2,0,2
30 DATA 0,2,0,2,0,2,0,2,0,2,0,2,0,2,0,
2,0,2,0,2,0,2,0,2,65,0,6
40 POKE 1536+4,PEEK(88):POKE 1536+5,PE
EK(89)
50 POKE 560,0:POKE 561,6
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	7629	20	9566	30	9231
40	7345	50	3786		

These back issues are still available

June issue: Analysis of the 130XE Submarine Adventuring, Random numbers Software reviews Frog Jump Microscope, Sounds Atari Insights Bit Wise Beginners and Graphics special 12 page feature on Communications.
July issue. Disassembler Bomb Run, DOS 2.5 17 Commandments, Adventuring Display List Tutorial Software reviews, Power Functions Treasure Hunt, Keyboard Sounds, Microscope, Insights – Bit Wise Beginners and Graphics.
August issue: Analysis of 520ST program protection routines Fruit Gambler Assembler Touch Tablet programs, first look at Logo Raider 1997, Dos 2.5 upgrade offer Display List Tutorial, Microscope, Software reviews, Insights – Bit Wise, Beginners and Graphics.
September issue: 8 page special on the 520ST Mode 8 screen dump routine, Maze Munch, Data Maker Display List Tutorial, 68000 addressing modes, list processing with Logo, Software reviews, Insights – Bit Wise Beginners and Graphics.
October issue. Computer Canvas graphics program, Updates for RAW 6502 assembler 130XE Ram-disc utility Hex/Ascii memory dump utility Pontoon Software reviews 68000 operating environment, Wrapitup Insights – Bit Wise Beginners and Graphics.
November issue. Converse program, Bitwise operator utility ST graphics examples, ST software list, Guy Fawkes game Display List tutorial Adventuring, Microscope, Software reviews Insights – Bit Wise Beginners and Graphics programming in C on the ST Adventuring Software reviews
March issue: Machine code games Pt. 3 Knight's tour program Compiler Pt. 1 Superscript review Check-sums for early games Book reviews Adventuring Software reviews, PLUS **Atari ST User** K Spread review Jeff Minter and Colour space Music Pt. 1 Making the most of the ST
April issue: Sound synthesiser Compiler Pt. 2 Using modes 12 and 13 Mancuna strategy game disc directory printing utility, Adventuring Software reviews PLUS **Atari ST User:** Review of TDI's Module 2, music via the Midi ports, Making the most of the ST and all the latest news
May issue: Sam Tramiel Interview Cavern Escape maze game Compiler Pt 3 Player Missile Graphics Pt. 1 Anna's Spelling Program, Adventuring Software reviews PLUS **Atari ST User:** Atari Show report, The Pawn and Disk Utilities reviewed ST Graphics Pt 1 Degas toNeoChrome Picture conversion program, Making the most of your ST and the latest 8-bit and ST news from the States.
June issue. Cavern Escape maze editor Part 1 of Great Little Gadgets – build a light sensor, Final part of Basic Compiler series, Five Liners £1 Player Missile Graphics Pt. 2 Adventuring Software reviews American Scene, PLUS **Atari ST User:** Conclusion of ST Art series, type in 3D maze game in Basic, Two 1 meg upgrades Software reviews, Making the most of the ST and all the latest ST news

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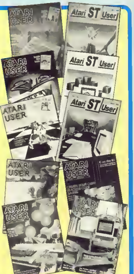

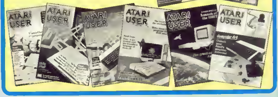

Keying in long programs too much of a chore?

Then give your fingers a rest by sending for our monthly disc or cassette containing all the programs from each issue of Atari User See order form opposite.

£3.95

£5.95

JUNE. Frog Jump: Guide the frog to his home in this version of the arcade classic **130XE Ram Power**: Use the extra 64k of memory to good effect. **Submarine**: Scuttle the submarines **Etcha-Sketch**: Draw pictures with a joystick **Random Numbers**: Get random numbers from machine code **Filthy Fifteen**. Can you keep the Filthy Fifteen happy in their cells?

JULY Bomb Run: Flatten the deserted city and land safely **Disassembler**: Find out what's going on deep inside your Atari **Treasure Hunt**: Use logical thinking to find the treasure **Password Generator**: Keep generating pass words till you find one you like **Keyboard**: Convert your micro into an organ **Quasimodo**. Can you sort out the mess of ropes in the belfry?

AUGUST Assembler: Make machine code programming easier **Frulti Gambler**: Save money with this fruit machine simulation **Mandala**: Complex patterns made easy **Protection**. Protect your programs from prying eyes **Display List**: Demonstration programs **Raider 1997**: Futuristic text adventure **Touch Tablet**: Demonstration programs

SEPTEMBER Maze Munch: Help Horace the Blob munch the maze monsters morsels **Data Maker**: Convert your machine code routines to DATA statements **Display List**: Demonstration programs **Screen Dumps**. Dump your Mode 8 screens to a 1029 printer **Bricks**: Solve the Bricks problem.

OCTOBER Pontoon. Twist? Bust! **Memory Dump**: Examine memory in hex and Ascii **Display List**: Demonstration programs **Wrap Trap**: Action game for one or two players **Computer Canvas**: Make your own micro masterpiece **Assembler Update**: Improvements for RAW assembler **Ram Disc**: Make the most of the 130XE's extra memory

NOVEMBER. Guy Fawkes: Help Guy escape from the guards **Converse**: Teach your Atari to be a psychotherapist **Display List**: Demonstration programs **Bitwise Operators**. Utility to provide logical functions **Circle**: Draw and fill a circle **Plus**: Freebie of the month **Creepshow** machine code pinball game

DECEMBER. Countdown: Micro version of the famous TV game **Get It Right!** Atari User's own check sum program **Disco**: Son et lumière on your Atari **List Utility**: Makes listing easier **Display List**: Demonstration programs **Plus**. Freebie of the month **Jane's Program** machine code entertainment.

BASIC COMPILER The entire set of Basic Compiler programs from the March to June issues on one tape/disc Write easy routines for your programs that will run at machine code speed Contains the Compiler, Library and many example programs. (N B. Requires an assembler.)

JANUARY 1986 Bells: Help Mr Humpy rescue Esmerelda. **Get it Right!** Atari User's own checksum program **Alien Attack**. The game to accompany the machine code series **Lister**: Make listing programs easy **Dots**: Play the micro or another player at this strategy game **Dump** 1020 printer/plotter routine **Plus**: Freebie of the month **Scramble Fighter** machine code game.

FEBRUARY Micropainter: Programs to manipulate Micropainter screens. **Clock**. Interrupt driven clock utility **Flasher**: Flashing colour utility **Bounce!** Simple to play, hard to master **Bridge**: The thinking person's card game **Plus**: Freebie of the month **Demon's Lair** – an adventure game you may never escape from.

MARCH Horse Play: Knight's tour program **Basic Compiler**: Program to accompany the new series **Alien Attack**: Final part of assembly listing **Plus**: Freebie of the month **Winston in the Caves** – can you keep your head and help Winston find his?

APRIL. Synthesizer: Activate the hidden depths of the Atari sound chip **Disc Index**: Keep track of disc files and free space with this index printing program **Graphics**: Make the most of Modes 12 and 13 **Menacuna**. Can you beat the game that learns from its mistakes?

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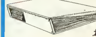

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Vol. No. 5
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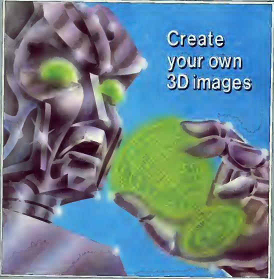
Atari ST User



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- *Three C compilers analysed and their benchmarks compared*
- *How does the two-player arcade game Time Bandit rate?*
- *Reviewed: Two books that take you inside the ST and GEM*

Educational BBC due for a caning

MIKE COWLEY reporting

CAN you keep a secret? Well the gossip is that the long standing affair between Miss UK Education Establishment (128k-64k 128k) and live-in lover BBC Micro is heading for the rocks Apparently – and only *Atari User* and Nigel Dempster are privy to this – she is secretly being wooed by a number of alternative suitors

There is little doubt that they are influenced by her money – it being a case yet again of never mind the boat race clock the purse And no doubt this accounts for the almost indecent bodice-ripping haste involved in the chase

It will all be to no avail however for I can now exclusively reveal that she only has eyes for the latest star to appear on the circuit – Mr ST himself

By carefully projecting his power without the price he is reported to have already successfully swept her off her feet The latest titbit is that she'll be booting out rather than up her elderly BBC Micro any day now But as one wit observed with his limited memory it shouldn't be long before he's forgotten it any way

But what do I base all this (nonsense) on? Well the signs are there for all those who are prepared to look The boys from Acorn have for too long now considered their educational market position unassailable just as the French did behind the Maginot line

The trouble was they failed to notice the longing glances being cast by Atari since the Tramiel clan replaced the corporate backbone in the company Now it may be too late for them to counter attack against the rapid advances Atari has made in this sector of late

Cleverly deciding to catch Acorn off guard by attacking the top end of the market Atari launched a pincer movement on the university front

The company's first breakthrough came when G & B Computer a London dealer landed an order for 60 520STMs from City University where the machines will be used to teach programming skills Only days later the redbrick University of Sussex fell under the ST onslaught of Brighton Computer Exchange

And now Atari is knocking loudly on the door of the Open University with a tender for 30 000 computers With the OU having made it a criteria that any computer bought must be MS/DOS compatible Atari was able to play its IBM add-on trump card

The advantage with this is that we are both PC/DOS and MS/DOS compatible says Atari UK boss Max Bambridge with undisguised glee So with our product more than fulfilling their requirements and at our price we must be in with a real chance at public tender With this one under our belt it won't be long before the ST is the required norm in the UK education scene

If that wasn't enough to turn the Acorn boys into lemmings then Atari had to give them a further prod by coming up with a BBC emulator Written by a freelance programmer it runs standard BBC Basic at the same speed as the Acorn machine

It's no wonder that some people at Acorn are growing increasingly concerned that this time it may be the Master that's in for a caning

* * *

IF you happen to have a friend who has paid out a far larger sum of money for an IBM PC or an Apple II than you have for your ST try dropping in this little gem at some convenient moment

Systematics International has recently put its popular accounts suite on the 1040STF It now turns out that the Atari version runs at three times the speed of its IBM PC counterpart and eight times faster than the one for the Apple II

* * *

THE ST is increasingly looking better value for money It all boils down to the price of the first class software now being made available for the machine

For the 520ST in particular it would be little short of ridiculous to fork out up to £500 even for such well known packages as dBase II from Ashton Tate But ST users don't have to because Versasoft has come up with dbMan to do the job at just £170

And for those who long for the Gone with the Wind of programming – Lotus 1 2 3 – there is the compatible VIP package for the ST which costs less than £200

* * *

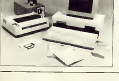
LOOK out for a new super-chip designed to rival the graphics blitter found at the heart of the Commodore Amiga It is currently being worked on under maximum security at Atari before release in a new ST model later in the year

Nothing more on the forthcoming machine yet apart from the fact it will have 2mb of memory and will probably not appear before the end of this year

* * *

A CLEANED up version of Atari's CP/M emulator for the ST is being offered by a dealer down in Essex The man behind the product – it costs £6 50 including post packing and VAT – turns out to be former Atari employee Mike Wilding

It includes one CP/M emulator disc a utility disc incorporating public domain software and a 14 page manual The latter is said to overcome the usual Atari problem – having the instructions for using the disc filed as a document – on the disc



Facts are well worth waiting for

ONE of the many problems facing users who buy their computer early in its life is the lack of quality programs and reference books. Programs allow users to get the most from their new machines, whereas reference books help them answer some of the many questions that they might have about their new purchase.

One of the first books to arrive for the ST is Harnessing The Power Of Your Atari ST by Tim Hartnell. It is well presented with many illustrative screen dumps and examples. However it is the overall content which lets the book down.

Mr Hartnell has split it into three main sections – Using the GEM desktop, Using Logo and Using GEM Draw. The first section describes how to manipulate such things as files and folders, but fails to say anything which isn't already covered in detail in the ST handbook supplied with the machine.

The Using Logo section is made up of some 90 pages which serve as a useful introduction for the beginner. It is well laid out with plenty of examples, supplying some information which isn't in the Logo handbook supplied with the ST and some information that is hidden deep within the handbook. It is a good introduction to Logo.

The final section explores the use of GEM Draw from Digital Research. This is also well presented with many helpful examples which would be advantageous to all owners of GEM Draw. The question is, how many people actually own this piece of software? Certainly you would not expect the first time user to buy such a product.

This book contains much well thought out material, but it is a pity that there is so little material which isn't already supplied in various manuals. This book would be useful for absolute beginners, but even they would probably out grow it fairly quickly.

I'm sure that we'd all rather wait a couple of months longer for our computer books, so that the authors can include information which isn't already supplied in the handbooks. After all the passing of information from the author to the reader is what a book is meant to do.

Problems, problems.

THERE have been lots of new and varied problems this month. Malcolm Crowe from Glasgow asks where he can obtain the AES and GEM manuals that I mentioned a couple of months ago.

These manuals are part of the Atari software developers kit. They are not intended to be used by non-software developers and are highly technical and generally user unfriendly. Another minus is the fact that the developers' kit costs over £300.

All of the information in the manuals is now available in various books from third party publishers such as 1st Publishing and Compute. I hope to obtain copies of these and shall tell you my views on them soon. *(See also this month's Book Reviews on Page 11.)*

Alan Philips writes from London N9 to ask if the 1040ST is available without a monitor. Alan already has a colour monitor and is trying to save some money by not ending up owning two of them.

If you really need a 1040 without monitor you're probably better off buying a 520STM, adding a double sided disc drive and expanding the memory with a board of the kind that AST sell. This will probably end up cheaper than a 1040 as well. Failing that, if you still desperately want a 1040 you may find a dealer who will split a 1040 package and sell it without monitor.

Alan also wants to know if it's safe to place his disc drives directly under the monitor. The Atari monitors have very high magnetic fields directly around them which can corrupt a disc and therefore make files unusable, causing many hours of work to be lost. For this reason you mustn't store your discs close to your monitor.

The disc drive is shielded against outside fields and so you shouldn't have any problems placing it near your monitor. That said, you won't find my drives anywhere near my monitor. It just isn't worth the risk. It's like storing valuable papers next to a raging fire – one small breeze and up go hours of work.

M Morgan from Baleares, Spain, asks why the control panel date and time are reset every time he switches on his ST. Unlike the Apple Macintosh the ST doesn't have a built-in battery to keep the clock running when your ST is turned off.

It is possible to build a battery clock circuit for your ST, but if you're not that confident with electronics you might consider buying AST's clock card. This keeps the clock running so that it's always correct when you turn on your ST.

Mr Ong from Singapore writes to complain that my method for auto running programs using an Auto folder doesn't work. Unfortunately any program that is placed in an Auto folder will be executed before the ST has properly initialised GEM.

This means that GEM isn't available to any program that you place in one. Only programs

→

Send your Atari ST queries to:
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that don't use GEM such as STWriter and some RAM discs can be auto run in this way You can place as many programs in an Auto folder as you like and they will be executed in the order in which they were placed in

Mr Blackwood from Manchester is worried over software compatibility between the various ST models The ST series is what is known as upwardly compatible

This means that anything written for the 520ST or 520STM will run on a 1040 but anything written for the 1040 might not work on the smaller machines At the moment there is very little software that requires the 1040's extra memory so you shouldn't have any problems with software compatibility

Brett McBain from Petworth, Sussex, has just upgraded to a ROM system and is having problems using the control panel If you try to boot the system using your old System Disc the old system will be loaded in as before and you will lose 200k and have all of the old bugs

To avoid this problem you should move the desk accessories and DESKTOP INF file onto a new disc You can then use this disc whenever you want to boot the system Another method is to place the accessories and DESKTOP INF on all your discs so that you can simply boot with any disc

The ROM system also allows you to rename your accessories as long as they still have the ACC file extender Therefore you can rename the supplied accessories to help you remember which accessory file contains which accessories For example you can rename DESK1 ACC to CONTROL ACC and DESK2 ACC to EMULATOR ACC as Atari has done on the more recent discs it has shipped

My thanks to Andrew Davidson who informs me that it is possible to reverse the display on a hi-res monitor This is done by moving the control panel sliders to their bottom position Having a reverse display may be preferred by some and it certainly makes Megaroids look more interesting

We at Atari ST User Towers would like to know what languages you have For example are there enough of you who own a C compiler to start publishing C listings? In order to answer this problem we need your help

If you write to me to ask for help on any subject I would also like you to tell me what languages you own and what you think of them I'll be publishing the results in a couple of months and hopefully your answers will help mould the magazine to your tastes ■

Stephen Underwood reviews two books on the ST

Mysteries no longer..

Title The Anatomy of the Atari ST
Authors: Gerits, Englisch, Bruckmann
Price £12.95
Supplier First Publishing Unit 20B Horseshoe Road Horseshoe Park Pangbourne Berkshire RG8 7SW Tel 07357 5244

AT last books are appearing that begin to delve into the internal mysteries of the ST operating system and to supply information not previously available in this country. With this book you can know at a single stroke more than Atari HQ's Hotline does.

Its 446 pages start by looking at the ST's hardware, then move on to cover the various software routines available. It is very much like the Advanced User Guide for the BBC Micro in the areas covered.

The hardware sections explain the ins and outs of the 68000 processor, WD 1772 floppy disc controller, MFP 68901, 6850 ACIAs and YM-2149 sound generator. Also examined are the keyboard and its controller, joystick ports and all the other sockets on the ST's outer case.

Each item is given a circuit diagram with the various pins named and background information on the registers used and the commands available to program it. The keyboard control routines are especially useful, allowing you to control the joysticks and mouse.

Perhaps the most useful section for the ST machine code programmer is the software section. This starts by looking at GEMDOS and all the different machine code calls available. Each command is described in detail with examples given where necessary. Since GEMDOS controls input/output routines and disc operations it is a powerful tool to acquire. BIOS (Basic Input Output System) and XBIOS are described in much the same way, in some cases overlapping with GEMDOS in function. Routines included in this section include calls to control the MIDI and RS-232 ports, and random number generators.

The next section is all about the Command Line A interpreter – a grand title for something that is a quick way into the vastly complicated graphics system. Fifteen routines are listed and these allow you to do such things as redefine the shape of the mouse, draw software sprites and lines, fill in simple graphic shapes and move blocks of memory around. A few more examples might have helped the reader to understand all that was going on here.

Exception vectors and interrupts are covered next. For anyone who fancies writing machine code routines to handle text, the VT52 emulator section is a must, with its listing of each text controlling routine.

The final two informative sections list all the useful memory locations plus a brief explanation of programming the 68000 processor. The former section gives the locations of such useful items as the start of free memory, start of screen memory and the system clock.

The remaining 80 pages give a complete breakdown of the BIOS listing. This section seems an excuse to pad out the book as it is useless to me as a programmer. It is quoted in the book as being valuable, but not why it is so. I have yet to find a use for it.

Verdict: A superb book aimed at anyone who wants to delve further into machine code and use the routines that the system supplies. This is the book I have been waiting nearly six months for.

The inside story of GEM

Title Gem on the ST
Authors Szczepanowski and Gunther
Price £12.95
Supplier First Publishing Unit 20B Horseshoe Road, Horseshoe Park Pangbourne Berkshire RG8 7SW Tel 07357 5244

GEM is the built-in software on the ST that controls such things as the test windows, drop-down menus and the mouse. It also controls a host of graphic drawing routines and text presentation. This book describes GEM in detail then goes on to look at each of the various GEM calls in turn.

As such it is vastly useful, supplying

→

information which is normally contained in the £325 GEM manuals but is not so easy to use because none of the routines are written in Basic

What the book does cater for is the machine code and the C programmers. However I should say at once that while the C programs work fine, I have yet to get one machine code program to do anything at all except produce errors with my assembler

It would appear that the key initialising routine was either written for an earlier version of GEM or contains a fatal error somewhere in its listing This is frustrating since I bought this book to use at the machine code level

It starts by looking at GEM in an overview and its two major divisions the VDI and the AES then goes on to explain how to use the programs in C and in machine code This is fine but the machine code section is not too clear and both explanations assume that you are in possession of the £1000 plus software package issued to software houses when the ST first came out Rather a limited audience to aim at I would have thought

Next come two massive sections describing all the VDI (Virtual Device Interface) and AES (Application Environment System) routines Each is described in detail the various variables used are listed as well as the information needed to include each routine in 68000 and C calls In addition some complex examples are given at the end of each section explaining briefly what each routine does and what should result

I feel that as a source book of information on the GEM calls this is hard to beat but lets itself down on that most important of areas explaining to Joe Public how to use those routines himself ■

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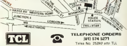

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A Basic route to 3D drawings

By GRANT OWEN

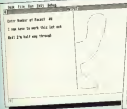
MANY simple drawing and doodling programs have been written for the ST. Now here is a short Basic one which will allow you to draw a shape and then convert it to 3D, even allowing you to look at it from varying angles.

Type in the listing and save a copy on disc. When you run it simply follow the instructions on screen. To define the shape point the mouse and click on the left button. Now move the pointer to the next point you require and press the button again.

Continue this process until you have finished your flat design – see Figure I – and then press the right button. You will then be asked how many faces you require the finished drawing to have. The maximum allowed is 60 which gives a very well defined circular drawing effect.

When all the calculations have been done the next question is the angle of view. Figure II shows the half-drawn shape with an angle of 0.5 selected, and Figure III shows the completed drawing. Figure IV shows the same design, but with an angle of 0 – in other words a cross-sectional view.

The program was written on a monochrome monitor but should work in the colour modes by reducing the 320 offset value – see lines 770-790 for example.



```
Enter Number of Faces? 40

I now have to work this lot out

Well I'm half way through
```

Figure I

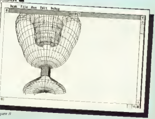
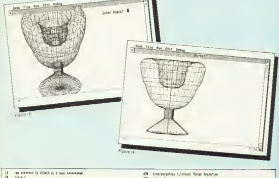


Figure II



```
Enter Angle? 
```

Figure 1c

Figure 1b

```
10   rem ******** 3D DRAWER by P Daps ********
20   fullw 2
30   gosub gemini: rem initialise mouse etc
40   maxi=50:dim x(maxi,50),y(maxi,50),z(maxi,50):rem set dimensions
50   clearw 2:gotoxy 10,3:?"Welcome to 3D Drawer"
60   gotoxy 13,7:?"Press Any Key to Continue"
70   gosub scan:clearw 2:rem scan keyboard clear screen
80   dx=320:dy=230:point=0:pi=3.1415927:rem starting point on screen
90   linef 320,1,320,320:rem vertical line to split screen
100  gosub getmouse:rem get x,y and buttons from mouse
110  if mk=1 then gosub store:rem if left button then store x,y point
120  if mk=2 then goto show:rem if right button then work out data for display
130  dx=mpx:dy=mpy:rem data x,y= mouse x,y
140  if point>1 then gosub lines:rem draw line from the first point
150  goto 100
160  show: gotoxy 1,1:input "Enter Number of Faces";f:rem get number of faces
170  gotoxy 1,3:?"I now have to work this lot out"
180  if f>49 then f=49:rem no more than 50 points
190  sn=sin(pi/(f/2)):rem get circular functions
200  cs=cos(pi/(f/2))
210  for l=2 to f+1
220  if l=f/2 then gotoxy 1,3:?"Well I,m half way through"
230  for k=1 to point
240  x(k,l)=x(k,l-1)*cs-z(k,l-1)*sn:rem point to x co-ord
250  y(k,l)=y(k,l-1):rem point to y co ords
260  z(k,l)=x(k,l-1)*sn+z(k,l-1)*cs:rem point to z co-ord
270  next:next:clearw 2:gosub display:if an=99 then goto 50
280  gosub scan
290  clearw 2:goto 80
300  store: point=point+1:rem increment pointer counter
310  flag=1
320  gotoxy 1,1:? point;" points set":rem display each time left button pressed
330  x(point,1)=dx-320:rem store x co-ord
340  y(point,1)=dy:rem store y co-ord
350  z(point,1)=0:rem store z co ord
360  gx=x(point-1,1)+320:gy=y(point-1,1):rem last point
370  gx2=x(point,1)+320:gy2=y(point,1):rem this point
380  if point >1 then linef gx,gy,gx2,gy2:rem draw line
390  if point=maxi then goto show:rem if more than 50 then draw in 3D
400  return
410  scan: key=inp(2):if key=27 then end else return:rem get key if esc then end
```

```
420  display:gotoxy 1,1:input "Enter Angle";an
430  clearw 2
440  if an=99 then return:rem enter 99 to go back to begining
450  for l=1 to f
460  for k=2 to point-1
470  h=320+x(k-1,l)
480  i=y(k-1,l)-an*z(k-1,l)
490  n=320+x(k,l)
500  m=y(k,l)-an*z(k,l)
510  linef h,i,n,m:rem draw the lines in 3D
520  linef n,m,320+x(k,l+1),y(k,l+1)-an*z(k,l+1)
530  next
540  next:goto 420
550  return
560  getmouse: rem get x,y and button state
570  gemsys(79)
580  mpx=peek(gintout+2)
590  mpy=peek(gintout+4)-37
600  mk=peek(gintout+6):rem button state
610  if flag=1 and mk=1 then mk=0:return
620  if mk=0 then flag=0
630  return
640  gemini: a#=gb:rem initialise gem array variables
650  control=peek(a#):rem not all of them are used
660  global=peek(a#+4)
670  gintin=peek(a#+8)
680  gintout=peek(a#+12)
690  addrin=peek(a#+16)
700  addrout=peek(a#+20)
710  poke gintin,3:rem change mouse to cross hair
720  gemsys(78)
730  return
740  lines
750  if opx=mpx and opy=mpy then return:rem if mouse not moved don,t bother to dr
760  color 1,1,0:rem line now white
770  linef x(point,1)+320,y(point,1),opx,opy:rem rub out old line
780  color 1,1,1:rem line now black
790  linef x(point,1)+320,y(point,1),mpx,mpy:rem now draw new line
800  opx=mpx:opy=mpy:rem get x,y co-ords for erasure next time
810  return
```

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NEWSLETTER

No. 11 July 1986

Scoop from Japan

ONE of the first reports of the arrival of Prince Charles and Princess Diana in Japan on their recent visit came direct to the UK from a MicroLink subscriber beating some of the international news agencies to the punch

Journalist Yu chi Ishikawa timed his message 12 00 BST 8 May 86 with the subject matter in capital letters 'WELCOME ROYAL COUPLE TO OUR COUNTRY

He even took time to design on his terminal two flags – the Rising Sun of Japan and the Union Jack

His message read I Japanese subscriber of MicroLink honour to report the Royal Couple from UK landed safely at Osaka International Airport now We are pleased their visit Weather fine Temp 70 degF

She wear white one piece Grandson of Emperor Hironomiya meet at airport Today they will stay Kyoto beautiful old capital of Japan I wish they see not only traditional Japan but also High Techs

Now weather is getting rainy Did they come with bad weather of England?' he joked

Exporters pick MicroLink

ONE of Britain's leading import-export organisations has chosen MicroLink as the communications medium for its near 10 000 members around the world

The prestigious British & Overseas Institute of Import Export Traders is a totally non-profit association run solely by its members who volunteer for election as officers

It was founded in 1972 by a group of small companies and individuals who pooled their resources and knowledge to start a joint export sales drive to promote their respective products in Europe

From this small beginning the Institute has grown to be a highly respected organisation with members all over the world

As its main function is to bring exporters into contact with overseas importers it is a logical progression to require a quick and efficient standard means of communication a spokesman said

As a result of this requirement the products and services committee of the Institute recommended all members to start using electronic mail

Bill Vickerman chairman and Bob Pinder senior exports consultant – both based in Liverpool and already MicroLink users – said they chose MicroLink because it was reasonable in cost and highly effective in its means of communicating with members

It is a quick means of spreading the information that our members need to conduct their business efficiently said Mr Vickerman

If is also a British service that is constantly bringing out new and better means of communication and in its way is a vital aid to our continual search for further British export trade"

Key in for world's hotels

MORE good news about the International Official Airline Guide which was added to MicroLink's growing list of value added services last month

As well as supplying the very latest data from more than 750 airlines worldwide – with details of 1¾ million flights – and ensuring trouble-free and more economical flight arrangements OAG also takes the strain out of choosing a hotel at the other end of your journey

The same source that provides you with unbiased up-to-date flight and fare information now brings a world of hotel and motel listings to your computer terminal

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C A language to harness the ST's sophistication

Peter Connors reviews three C compilers

THE ST is here to stay, and with it comes computing sophistication with an immense potential to unleash the power of professional computing languages to the home user.

"So what?" I hear you say, and the answer is that applications which seriously attempt to tap even part of the ST's power will have to use a language which lets it off the leash.

This is where C comes in. It is a structured language of great power used to write a huge range of software including operating systems, interpreters, databases and even Megaroids. Importantly for us Gem and TOS routines for the ST are documented in C. More important still, software written in C has greater portablity to another machine than if a Basic or 68000 assembly language were used.

Need more convincing? Think about this – portability is saving us money right this very minute. Why? A lot of the languages now available for the ST are existing packages for other machines. Stuff that runs on a 68000 in a Macintosh will run on an ST with very little juggling. Even software for the IBM will transport across to the ST as long as it is written in a portable language like C and it isn't hardware-specific.

And here's the payoff – all those Macintosh and IBM users paid up to £300 or more for their software. That means the publishers have most likely got their program development costs back before they arrived on the ST market and can thus make the ST price lower – and lower still, because how can you charge IBM rates for an Atari priced bundle that throws in free software?

With software charges held in check by low hardware costs the era of inexpensive but powerful software has arrived. There are lots of cheap goodies on the way.

This review is of three C compilers – from Digital Research (as supplied with the ST Development Pack), the Cambridge company GST and Lattice C from Metacomco. Unlike interpreters – the Basic in most micros is an interpreted language – they need to have source code written, then compiled in one or more steps and then linked to a library of ready-compiled routines for those functions frequently used.

The result is a program locatable anywhere in memory which you find as a .PRG file on your ST discs. This process is called development and it is gone through many times in arriving at a new piece of software. In looking at compiled languages you need to know how close to the language standard it gets, how easy it is to compile, how small the .PRG module is and how fast it runs.

The latter is familiar as a benchmark time, but shouldn't be looked at in isolation – compilers that produce faster times than others sometimes need more memory and more patience during development.

I've tried to compare all these factors for the products under review in such a form that comparisons may be made with the performance of compilers on other machines. Purists argue

```
/***********/
/*  start  */
/***********/
long time, *ticks = 0x4BA;
printf("\nPress a key to start:");
getchar();
Super(0);
time = *ticks;
```

```
/***********/
/*  end    */
/***********/

time = *ticks - time;
Super(0);
printf("\nTicks = %d",time);
printf("\nPress a key to exit:");
getchar();
```

```
/************/
/* empty.c */
/************/

#include "stdio.h"

main()
{
;
}
```

The Start and End source files plus a null statement program to test the compiler's overheads that benchmark results aren t comparable because for example one version of C might use a 32 bit value for ordinary integer variables where another uses a 16 bit value but I ve used the default size of int for the C under test

This was 32 bits for Lattice and GST but 16 for DR giving it an advantage in those tests where variable length is important I ve tried to point out some of the effect this has where it occurs

An additional point to look for where a compiler has been developed on another machine is the size of memory it will handle without extra commands – because the IBM processors only look at memory in 64k chunks some compilers need you to add steps if you want to address memory further away than the 64k titbit you re in

To show just how fast the ST goes with the right language I repeated the sieve using register variables where the package supported it when you look at the times remember that an IBM AT running Digital Research C takes 3 71 seconds and even a VAX 11/750 needs 2 41

A mixture of standard routines were used for the benchmarks – the listings were as shown with minor variations to accommodate the GST C

Empty compiles a C program containing nothing but a null statement in order to see how big a program module is needed just for overheads

Sieve is famous Sieve of Eratosthenes done 10 times for prime numbers up to 8190 Although the ST s 32 bits will take the search an awful lot higher this low value was chosen to allow comparison with weedy machines

Fib is a Fibonacci series done 10 times up to the 24th value – again an old favourite in the benchmark stakes

Frame performs a FOR loop 10 000 times

Float performs some decimal point maths 10 000 times

Intmeth is a x10 000 looped series of integer arithmetic routines mixed with some bit-shifting

Pointer uses C s powerful indirection pointers to set the value of a 128 character array 10 000 times

Savage loops a bunch of trig functions 2500 times to check accuracy – in a perfect world the answer should be exactly 2500

It is noted where a test was impossible to perform Some comparisons were made with the ST Basic – where I managed to remain awake before a benchmark finished Times are accurate to five milliseconds and to get them the ST's 68000 was put into user mode in order to access the 200Hz system tick via a C pointer to protected memory at $4BA

See the Start routine listing for the details – this and an End routine were put into each benchmark as an include file and the program size figures thus include this code All times are in seconds and PRG sizes in bytes Compile times are for a complete compile and link cycle

For a number of reasons it took longer to produce these results than it should have – my disc based TOS was such an early version it kept bombing after repeated development cycles my one double-sided drive was barely adequate – you really need at least two single sided drives or one and a RAMdisc to compile with ease then I had to add another half megabyte of memory to use a RAMDisc with a disc-based TOS Once my TOS was a Version 19 in ROM I had no problems

Digital Research C

DR s C came as part of a preliminary version of the multi-disc Development Pack for the ST It is expensive about £400 but includes a pile of other information and software essential to the serious developer – not least of which is a full set of Gem documentation

Although the other Cs had Gem functions in their library they didn t have this full documentation probably because the mountain of paper needed takes longer to write than the compiler Even so the DR paperwork left a lot to be desired in this incarnation The pack didn t include an editor so the editor supplied with GST C was pressed into service

Compilation is run by a batch program which invokes a three-pass compiler and then an

```
/************/
/* sieve c */
/************/

#include "stdio h"
#include "osbind.h"

#define SIZE 8190

char flags[SIZE+1] = {0};

main()
{
int i,prime,k,count,iter;

#include "start"

for (iter=1;iter<=10;iter++)
 {
  count=0;
  for (i=0;i<=SIZE;i++)
   flags[i]=TRUE;
   for (i=0;i<=SIZE;i++)
    {
     if (flags[i])
     {
      prime=i+i+3;
       for (k=i+prime;k<=SIZE;k+=prime)
        flags[k]=FALSE;
       count++;
      }
    }
  }
#include "end"
```

The famous Sieve of Eratosthenes run 10 times for prime numbers up to 8190 assembly stage A further batch step allows linking to the libraries of C, Gem and floating-point functions before producing a relocatable PRG module Comprehensive error messages are available and a step for deleting intermediate files is included

It was all a bit fiddly but produced compact fast-running PRGs except while using the floating-point routines when the phenomenally fast times were revealed to be the result of incomplete implementation of the maths functions

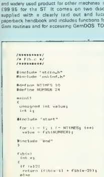
Single precision results were always produced when doubles had been requested tan and atan functions weren t available and even when they had been left out of the Savage benchmark it came up with a dismally inaccurate result at least 1000 out

Although I suspect later versions of the DR C will be improved my experience so far with ST Basic indicates similar results – suspiciously fast double precision arithmetic and wild inaccuracy on the Savage benchmark

Lattice C

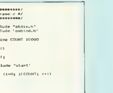
Metacomco markets Lattice C an established and widely used product for other machines at £99 95 for the ST It comes on two discs supplied with a clearly laid out and lucid paperback handbook and includes functions for Gem routines and for accessing GemDOS TOS and the BIOS but these are less comprehensively defined than the standard C functions for the paper mountain reason It comes with a screen editor employing a comprehensive set of commands

A batch program is again used for the two-pass compiler which generates a list of messages when errors occur There is an option to compile into a form which may either be linked



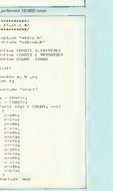
```
/**********/
/* fib.c */
/**********/

#include "stdio.h"
#include "osbind.h"

#define NTIMES 10
#define NUMBER 24

main()
{
 unsigned int value;
 int i;

#include "start"

 for (i = 1; i <= NTIMES; i++)
  value = fib(NUMBER);

#include "end"
}

fib(x)
 int x;
{
 if (x>2)
  return (fib(x-1) + fib(x-2));
 else
  return(1);
}
```

A Fibonacci series, done 10 times to the 24th value



```
/***********/
/* Frame.c */
/***********/

#include "stdio.h"
#include "osbind.h"

#define COUNT 10000

main()
{
int i;

#include "start"

 for (i=0; i<COUNT; ++i)
  {
   }
  }

#include "end"
}
```

A FOR loop performed 10 000 times



```
/***********/
/* Float.c */
/***********/

#include "stdio.h"
#include "osbind.h"

#define CONST1 3.141597E0
#define CONST2 1.7839032E4
#define COUNT   10000

main()
{
 double a, b ,c;
 int i;

#include "start"

 a = CONST1;
 b = CONST2;
 for(i =0;i < COUNT; ++i)
  {
   c=a*b;
   c=c/a;
   c=a*b;
   c=c/a;
   c=a*b;
   c=c/a;
   c=a*b;
   c=c/a;
   c=a*b;
   c=c/a;
   c=a*b;
   c=c/a;
   c=a*b;
   c=c/a;
  }
 #include "end"
 }
```

10 000 Floating Point Calculations

by the Digital Research linker or by the supplied GST linker program. Development was very smooth and the fastest of the three packages tested. It needed less passes than the DR C and generated less intermediate files.

This is important if you are running your disc close to its maximum capacity – development stops with an Unable to open file XXX type of message. Lattice was closest to the Kernighan and Ritchie language definition of the three tested with almost imperceptible differences to standard C.

Program modules weren't quite as small as DR but they ran nearly as fast, even though Lattice used the ST's natural 32 bit integers compared with DR's (IBM orientated?) 16 bits. By declaring any int as a short in the Sieve Lattice shaved 0.6 seconds off. The change was even more spectacular with Intmath, where the time was chopped by a factor of eight.

This was the only C under test where floating point was properly supported, so that I couldn't compare it with the other two. Accuracy was high on Savage at 2499.99999968363 and the Float routine was at least two and a half times faster than comparable Cs on the Macintosh. I liked Lattice immensely.

```
/*************/
/* intmath.c */
/*************/

#include "stdio.h"
#include "osbind.h"

#define COUNT 10000

main()
{
int i,j,k;

#include "start"

 for (i=0; i<COUNT; ++i)
  {
   j=240; k=15;

   j=k*(j/k);
   j=(k*(j/k));
   j=(k+k+k+k+k+k+k+k+k+k+k+k+k+k+k+k);
   k=(j-k-k-k-k-k-k-k-k-k-k-k-k-k-k-k);

   j=(j<<4);k=(k<<4);
   j=(k*(j/k));
   j=(k*(j/k));
   j=(k+k+k+k+k+k+k+k+k+k+k+k+k+k+k+k);
   k=(j-k-k-k-k-k-k-k-k-k-k-k-k-k-k-k);

   j=(j<<4);k=(k<<4);
   j=(k*(j/k));
   j=(k*(j/k));
   j=(k+k+k+k+k+k+k+k+k+k+k+k+k+k+k+k);
   k=(j-k-k-k-k-k-k-k-k-k-k-k-k-k-k-k);
  }
#include "end"
}
```

10 000 loops through same integer math routines and bit-shifting

GST C

GST's £59.95 budget package arrived the morning after I'd made a credit card order and although service like this appears to be becoming more common it was fun to play with it before breakfast. At the time of writing GST was including a free Fractal generator written in C.

Despite being a limited implementation of C it is a version which is possible to get to grips with before the cornflakes. It uses a window-based shell program which allows you to carry out editing, compilation, assembly, linking and running a program from a command window to which you return at the end of each stage.

Conveniently it also automatically displays any program output in a window without you having to write the Gem stuff needed to set it up and keep it going. This saves a lot of hassle but the price paid is in the larger size of program modules needed.

It comes with loose leaf documentation describing the separate parts of the system – some TOS and Gem routines were included but like Lattice needed fuller explanation. The GST editor was the nicest to use – it felt like First Word without the fancy bits, and the Pause on error option during compilation was very useful for examining mistakes one at a time rather than

```
/*************/
/* pointer.c */
/*************/

#include "stdio.h"
#include "osbind.h"

#define COUNT     10000
#define ALLOTTED 128

main()
{
char workarea[ALLOTTED], *ptr;
int i;

#include "start"

for(i=0;i<COUNT;++i)
 {
  ptr=workarea;
  while (ptr<(workarea+ALLOTTED))
   {
    *ptr=' ';
    ++ptr;
   }
 }
#include "end"
}
```

Using pointers to set up a 128 byte array 10 000 times having to dump an error file to printer

Although especially fast to compile in RAMdisc this was the least complete version of C but the handbook mentions that it will be enhanced "as a medium term activity" Floating point and register variables were not available Despite this it is a friendly way for the C novice to begin getting to grips with the language without depleting the bank balance too much

With all those windowing overheads the PRG modules were significantly larger on this C and at times were slower Declaring a 16 bit short in place of a 32 bit integer more than halved the Intmath time but only took 0 8 second off the Sieve

There was no easy way to get the 68000 into supervisor mode in this C so times are the average of three runs measured on a stopwatch with 0 05 second divisions In the case of Frame I did a million loops and divided the result by 100

Conclusions

These products are aimed at different markets so there isn t really a best buy I felt most comfortable with the completeness and speed of Lattice C but the GST suite s friendliness is a help if you re sticking a toe in the C for the first time

The Development Pack allows every nook and cranny of the ST to be explored but you must expect to lose a little sleep over it The paperwork is essential reading if you intend to write something for the software top ten but you might prefer to use another C especially if floating point is needed You pays your money and you takes your choice ■

Product Lattice C
Price £39 95 inc VAT
Supplier Metacomco 26 Portland Square
Bristol BS2 8RZ Tel 0272 428781

Product GST C
Price £59.95 inc VAT
Supplier Electric Software 91 High Street,
Longstanton Cambridge CB4 5BS Tel 0954 81991

Product Development Pack (includes Digital Research C, utilities and a resource construction set for GEM on 5 discs plus reams of documentation)
Price £325 plus VAT
Supplier Atari Railway Terrace Slough
Berkshire SL2 5BZ Tel 0753 33344

```
/************/
/* savage.c */
/************/

#include "stdio.h"
#include  osbind h"

#define ILOOP  2500

extern double  tan(), atan(), exp(), log(), sqrt();

main()
{
double a;
int i;

#include  start"

 a = 1.0;
 for(i   1; i( (ILOOP-1); i++)
  a = tan(atan(exp(log(sqrt(a*a))))) + 1.0;

printf( a = %20.14e\n", a);

#include  end"
}
```

The final test – complex floating point trig routines are tested 2500 times for accuracy

Time in seconds

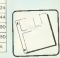
	DR	Lattice	GST	STBasic
Sieve Register	4 01 2 32	*4 91 3 19	7 8 N/A	962 5 N/A
Fib	16 44	19 54	21 8	N/A
Intmath	3 72	*19 32	10 2	N/A
Frame	0 06	0 08	0 16	9 1
Pointer	13 3	14 64	28 1	N/A
Float	*14 53	105 08	N/A	*195

** See text for comments*

PRG size COMPILE time

	DR	Lattice	GST
Sieve Compile	12598 360	15221 214	31730 279
Empty	6271	10497	21244
Fib	12520	15167	23424
Intmath	13038	15481	24244
Frame	12464	15093	23290
Pointer	12492	15123	23380
Float	*12778	15635	N/A

** See text for comments*



Atari ST User

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Bandit should pass the test of time

By Jason Kingsley

Program *Time Bandit*
Price *£25 95*
Supplier *Microdeal 41 Truro Road, St Austell, Cornwall Tel 0726 68020*

THE game is based around a race of Time Lords, the creators of the fabled Time Gates As usual in these situations some of the all powerful beings are corrupt, and use the gates to their own ends, to achieve universal domination and amass unimaginable treasures

For some reason best known to The Creators you a Time Bandit have been asked to go in search of these treasures Suspecting that your motives are none too altruistic they have offered lots of cash in return for your help

You can forgive the rather flawed and cliched logic of the background and even the tacky introductory poem if the game is good fun, and it certainly is

The game opens with a screen that presents various options – one or two player mode keyboard or joystick and so on The two player mode is interesting in that it allows either cooperation or feuding between two players

In the one player mode the game occupies the left half of the screen and with two players each have their own half

It is dangerously fascinating to watch someone else s action when you ought to be concentrating on your own play If one bandit shoots the other the dead one can continue the game as a shadow helping or hindering the offending player Revenge is sweet so I ll let you guess which of the two is the more likely

The Time Gates are essential components of this game Each one of the 16 contains 16 subsections all of which must be completed to end the game

To help you on your way the lands are strewn with pulsating keys Once picked up these open logically enough pulsating locks Every key will open one lock When all are opened you can reach the mystical Way Out and the next phase of the adventure

Game play is relatively simple – shoot anything and everything that moves This is easy and as they re all evil guardians you need feel no guilt anyway Avoiding being shot is more difficult though

Heroism and derring do are rewarded with more cubits and often in my case death Every thousand cubits buys you an extra life Is this game entirely based on capitalist principles?

Each gate takes you to a different time or dimension, where a new challenge awaits Behind each lurk wild shoot-em-ups Pac-Man mazes text adventures and beyond

The authors Bill Dunlevy and Harry Lafnear of Michtron Inc have included a great deal of tongue-in-cheek humour so boredom shouldn t be one of your problems

Time Bandit bears a striking resemblance to the new arcade game Gauntlet, and no doubt draws some inspiration from this source The scenery scrolls around you as you move allowing the playing field to be many times the size of the screen

It is very easy to get lost in some scenarios especially with the presence of frustrating one-way doors so map making is almost essential

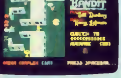
The characters and settings are colourful and fun the action smooth and fast It would no doubt be considered stunning on any machine other than the ST, but I m sure things can get even better – a challenge perhaps?

One word of warning – the game will only run on an ST with a colour monitor By doing this Microdeal has considerably reduced the market for this game and if you are the unhappy owner of a monochrome monitor you will be disappointed

Unless your powers of persuasion are sufficient to acquire a colour version for an evening or you have the technical skills to work out some way of fooling the ST Time Bandit will remain out of reach

Microdeal has clearly put its paws on an excellent product Just how well Time Bandit will stand the test of time against future products from companies like Rainbird is difficult to tell I suspect it will pass with flying colours ■

Sound	7
Graphics	9
Playability	9
Value	7
Overall	9



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